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THE SOCIAL VALIDATION OF INSTITUTIONAL INDICATORS TO
PROMOTE SYSTEM-WIDE WEB ACCESSIBILITY IN
POSTSECONDARY INSTITUTIONS

by

Heather Ann Mariger

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Instructional Technology and Learning Sciences

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2011

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ABSTRACT

The Social Validation of Institutional Indicators to Promote System-Wide
Web Accessibility in Postsecondary Institutions

by

Heather Ann Mariger, Doctor of Philosophy

Utah State University, 2011

Major Professors: Dr. J. Nicholls Eastmond and Dr. Cyndi Rowland
Department: Instructional Technology and Learning Sciences

The Internet is an integral part of higher education today. Students, faculty, and staff must have access to the institutional web for essential activities. For persons with disabilities, the web is a double-edged sword. While an accessibly designed website can mitigate or remove barriers, an inaccessible one can make access impossible. If websites that provide necessary information are not accessible, those with disabilities will be unable to independently complete their daily tasks or compete in the modern world.

Project GOALS (Gaining Online Accessible Learning through Self-Study) has developed a document outlining a set of four institutional indicators of Web accessibility. Postsecondary institutions can use this document in their efforts to ensure that online content is accessible to all users.

This dissertation evaluated the social validity of the document to determine if it was appropriate, understandable, usable, and satisfactory to provide a framework for

implementing and promoting institution-wide web accessibility across a variety of demographic markers including job type (administrator, faculty, and technology specialist) and institution type (2- and 4-year).

Ninety-seven participants reviewed the document and completed an online survey. All four indicators with their subsequent benchmarks were found to be “good” or “very good” based on the evaluation criteria. Administrators rated the document somewhat lower than faculty or technology specialists. Participants from 2-year schools consistently rated the document higher than their 4-year counterparts. In general, the longer participants had been in their positions, the less favorably they rated the document.

The median ratings for all questions of appropriateness, understandability, usefulness, and satisfaction were a 6 or 7 on a 7-point scale across the board. This result would indicate that while different aspects of the indicator document may appeal to different groups, participant ratings across job and institution type show that these criteria achieve acceptable levels that validate the use of the indicators as a tool to assist institutions in their web accessibility efforts.

This dissertation utilized the multiple-paper format recommended by the committee. The three papers will be submitted to the *Online Journal of Distance Learning Administration*, the *Journal of Special Education Technology*, and *Educause Quarterly*.

(254 pages)

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Heather Ann Mariger

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CHAPTER 1

INTRODUCTION

Most Americans will experience a disability in their lifetime (Centers for Disease Control [CDC], 2007). This disability could be temporary, such as a broken leg, or a condition that persists for a much longer term. The U.S Census Bureau estimates that 54.4 million, or 19% of Americans have some form of disability (US Census Bureau, 2008). This number is on the rise from 51.2 million (or 18%) in 2002 (US Census Bureau, 2007). An estimated 8.5% of the population has at least one disability that impacts computer and Internet use (Waldrop & Stern, 2003). For some people with disabilities, computers and the Internet can be a boon. Assistive technology has the potential to offer many of these people access to a great deal of information that was previously unavailable to them (Casey, 1999; US GAO, 2009). Students with visual impairments once had to rely on assistance to enroll and register for classes. Now, online registration systems at many Universities allow students to retain their privacy and independence (WebAIM, 2003). However, assistive technology alone cannot overcome many of the access problems created by improperly designed or formatted websites (Schmetzke, 2001).

Each day students can find new ways to interact with their education provider as new functions are added to sites. It is clear that the web is seen as a central element in postsecondary education. So much so that many institutions are dedicating enormous resources to keep up with the advantages that this technology holds for students. (Rowland, 2000, p. 1)

As the Internet expands, postsecondary education is using the Web for everything from course catalogs and registration to transcripts and records to teaching and testing

(Waddell, 2007; WebAIM, 2004). Much of the information in education is now disseminated using the Internet as opposed to traditional print-based methods. If websites that now provide necessary information are not accessible, students with disabilities will be unable to independently complete or compete in these courses (Schmetzke, 2001; Rowland, 2000). According to Web Accessibility In Mind (WebAIM; 2004), inaccessible sites limit the opportunities for students with disabilities to participate in the educational experience in an equitable manner with their peers. “Postsecondary education systems must be created and sustained to help students with disabilities participate in the web-based society that is growing each day” (WebAIM, 2004, p. 1). Moreover, strong technology skills can be critical for employment. If students do not have the opportunity to experience and practice these skills, they may have difficulty competing with technology savvy students once they leave school (Peterson, 2005).

Web (In)Accessibility in US Postsecondary Education

Despite a number of laws and regulations that have significance for the rights of students, faculty and staff with disabilities (e.g., the Americans with Disabilities Act [ADA] and Sections 504 and 508 of the Rehabilitation Act), online accessibility at the postsecondary level leaves a great deal to be desired. In a study of 400 US universities and online learning institutions, Rowland and Smith (1999), found that only 22% of the sample had front pages that were rated as “approved” using the Bobby (version 3.0) evaluation software. Of those institutions whose front pages were approved, only 3% of the sample had a page selected that was approved one layer down. Almost a decade later,

things have improved only slightly if at all. In 2008, The National Center on Disability and Access to Education (NCDAE) found that, in a national snapshot of 100 higher education institutions, a random sample of webpages one step off of the home page, 97% contained accessibility errors (NCDAE, 2008).

Many institutions believe that if they follow the letter of the law, providing “reasonable accommodations” as mandated by the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, this is enough. However, after-the-fact accommodations (i.e., retrofitting inaccessible web content on request as a means to provide access) are less efficient to produce and maintain than content designed with accessibility in mind. Moreover these accommodations do not provide an equivalent experience for the user (WebAIM, 2004). Waddell (2007) noted that costs of providing individual accommodations can be much greater than implementing a proactive plan of accessibility. Furthermore, The US Department of Education, Office for Civil Rights (OCR), requires that communication (including Internet and library resources) provided to a student with disabilities be as effective as that given to other students. Effective communication is defined by three components: timeliness of delivery, accuracy of translation, and provision in a manner and medium appropriate to the significance of the message and the abilities of the individual with the disability (Waddell, 2007). The first requirement, timeliness of delivery makes proactive accessible design especially important. A student’s ability to immediately access a website while another student has to request an accessible format, and then wait an indeterminate time for delivery, creates an inequity which can affect student experience and student learning. This imbalance can

also affect student outcomes, satisfaction, and persistence and can lead to formal complaints or lawsuits potentially costing an institution considerably more than it would have cost to create universally accessible websites to begin with (Waddell, 2007).

While many acknowledge that web accessibility in its current state is a problem, most institutions grapple with questions of how to achieve and maintain anything better. Barriers include: a lack of awareness by designers, costs and staffing concerns, a lack of knowledge or training, insufficient support from administration, lack of faculty involvement, inadequate technical support, and widespread apathy (Kubarek, Mitrano, Rowland, & Trerise, 2006). A 2006 assessment of web accessibility in Oregon Community Colleges found that those persons with a knowledge of disability issues (i.e., disability services) and those working in Information Technology (IT) services were not integrated in their approach to web design, thus making it difficult to discuss, let alone develop, a comprehensive accessibility plan (Wisdom et al., 2006). Furthermore, the decentralized nature of most postsecondary institutions can negate the work done by individual champions, or even departments, to ensure that their webpages are accessible. The most accessible webpage in the world is still inaccessible if a user with disabilities must navigate inaccessible pages to get to it (Rowland, 2007). Successful implementation of web accessibility requires commitment and systemic action on an organizational scale (WebAIM, 2004).

Web Accessibility and System Change

In order to create sustainable accessibility in postsecondary education, systemic

change is needed. Higher education officials must work to affect a pattern of enterprise-wide change to address and maintain web accessibility in postsecondary institutions (WebAIM, 2004). A system-wide plan helps to prevent unnecessary program duplication, prevents turf battles and encourages cooperation (Rabuzzi, Carson, & Conklin, 2001). However, system change is difficult and there are few change models that a university could follow to achieve organization-wide accessibility (Rowland, 2007). “Transforming the climate of an organization with regard to disability access is not a simple process. It is a complex one whose scope and importance are increasing with the growth of the Internet’s use” (WebAIM, 2004, p. 1).

Berge (1998) stated that changing the culture of an institution does not generally occur through direct action but through changes to policy. However, changes to policy require strong administrative leadership at the highest levels to overcome resistance from institutional culture as well as more practical barriers to change such as the lack of resources and knowledgeable people. As such, resources that can help guide and influence administrators are greatly needed.

Given the limited resources and growing demands on postsecondary institutions, what can be done to encourage administrators to commit the necessary resources and leadership to ensure accessibility? Almost a decade of technological advance has not provided the impetus for improved accessibility on its own merits (NCDAE, 2008). Among the potential reasons for the lack of progress is that administrators and faculty do not have the necessary understanding of accessibility. While there are any number of resources for web developers, little has been created that nontechnical personnel can

understand and use to guide their actions. Thus it may be difficult for administrators to articulate what is required for their institutions. Additionally, administrators are often bombarded with requests and requirements from many different interests, and while they may agree with the importance of web accessibility, it is seldom high on their priority list (WebAIM, 2004). A review by Project GOALS (Gaining Online Accessible Learning Through Self-Study) of 100 randomly selected postsecondary institutions found that only 17% had any formal policy available from their institutional websites that covered the accessibility of web content for individuals with disabilities (NCDAE, 2008). In order to promote online accessibility in postsecondary institutions, a way must be found to educate administrators and faculty while providing motivations that encourage system change.

Web Accessibility, Accreditation, and Project GOALS

One possible motivation for administrators and faculty to incorporate web accessibility into their systems is to tie accessibility into the process of institutional accreditation and cycles of reaffirmation. According to Eaton (2006),

Accreditation is a process of external quality review created and used by higher education to scrutinize colleges, universities and programs for quality assurance and quality improvement. Accreditation in the United States is more than 100 years old, emerging from concerns to protect public health and safety and to serve the public interest. (p. 1)

While accessibility is not a specific guideline for any of the six regional accreditation agencies that govern postsecondary education in the US, the foundation for web accessibility is present in the existing guidelines and standards of all six agencies. As

such, web accessibility can effectively be incorporated as part of a system of self-study and continuous quality improvement or other initiatives recognized in the evaluation process (Mariger, Rowland, Whiting, Christensen, & Rigley, 2010).

In 2007, NCDAE, in partnership with WebAIM, received a grant from the Fund for the Improvement of Postsecondary Education (FIPSE) to develop, evaluate, and disseminate materials and processes in web accessibility that institutions of education can use in their efforts to ensure that online content is accessible to all users. This grant, Project GOALS, was tasked with creating a set of deliverables including:

1. An Action Paper targeted to high-level postsecondary administrators (e.g., CIO's, CAO's),
2. A document of institutional "indicators" that outlines best practices for electronic-accessibility in education.
3. A web accessibility benchmarking and planning tool to assist institutions in assessing, planning, tracking and improving an institution's web accessibility. (Project GOALS, 2009)

It is believed that these materials can help administrators, faculty, and technology staff to understand and exercise accessibility. A key deliverable was the document, "Recommended Practice Indicators for Institutional Web Accessibility" that would set the stage for the web-based benchmarking and planning tool to follow. Therefore, it was essential that these indicators be made accurate, understandable and usable for the target audiences (administrators, faculty and staff, and technology specialists).

Development of the Indicator Document

The GOALS team wanted to create a process to assist institutions as they work to achieve web accessibility. This process needed to be detailed enough to serve as a useful

blueprint for web accessibility but open-ended enough to be adaptable to the unique situations of an array of institutions. For inspiration, the team looked to other models of system reform such as self-study and benchmarking.

Self-study is used by institutions during the accreditation process and at other times to help assess progress, show accountability, and promote and maintain quality within the organization (Council for Higher Education Accreditation [CHEA], 2007; Glidden, 2006; Western Association for Schools and Colleges [WASC], 2010).

Benchmarking provides a process in which best practice is identified and used as a tool for learning and continuous quality improvement (Oakland & Tanner, n.d.).

These two models provided the groundwork for process development along with examples provided by our project partners. The first was Web Accessibility in Mind (WebAIM's) *8-Step Implementation Model of Reform* (WebAIM, 2004). The second was the Western Interstate Commission for Higher Education (WCET's) *Best Practices for Electronically Offered Degree and Certificate Programs* (WCET, n.d.); this document helped to provide a similar service to the burgeoning field of Web-based Distance Education in its early years. WCET's best practice document was so successful, in fact, that it was adopted by the regional accrediting commissions and is now used as their standard guide for evaluation of online programs (WCET, n.d.).

GOALS partners identified four key conditions absolutely necessary to support institution-wide web accessibility. These conditions, or "indicators," are each comprised of several "benchmarks" or aspects of that indicator. The benchmarks are, in turn, expressed through a series of "evidence"—actions and documentation that substantiates

that specific benchmark. The strength of the benchmark is based on the evidence that supports it. These three tiers provided the framework for the Indicators document. To view the full Indicator document, visit: <http://www.ncdae.org/goals/indicators.php>.

Product Evaluation

Product testing during the formative stages of development yielded valuable data that informed project staff the best ways to augment the indicators before they were released to the public. Formative evaluation provides developers with data on how to improve the design of a product and can provide insight into marketing and distribution of the product as well (Borg & Gall, 1989, p. 764). By testing the indicators while they are in development, it is possible to find and resolve potential problems that could prove disastrous if found once the indicators (and all of the products built upon them) were completed. Testing is required to validate the indicators and ensure that they are appropriate and useful for the target audiences. Additionally, the results of product testing has helped Project GOALS make improvements to the institutional indicators as well as the GOALS benchmarking and planning tool that followed it.

According to Kazdin (1977), social validation can be defined as assessing the social acceptability of a program or intervention. Social validation has been used in behavioral research since its introduction by Montrose Wolf in 1978 (Schwartz & Baer, 1991). It is a method of assessing and analyzing consumer behavior (Gresham & Lopez, 1996) and can evaluate the acceptability and/or viability of a program (Schwartz & Baer, 1991). Social validation can be an effective method to evaluate customer satisfaction with

a product or process (Fawcett, 1991). “Social validation is also being used as a strategy to program for or help ensure selection of socially important goals, development of socially acceptable procedures, and attainment of socially important effects” (Fawcett, 1991, p. 235).

Wolf (1978) posited that social validity could be established on three levels: (a) the social significance of the goals; (b) the social appropriateness of the procedures; and (c) the social importance of the effects. The purpose of this project was to evaluate the second aspect (social appropriateness) of the institutional indicators developed by Project GOALS using three target audiences (administrators, technology staff, and instructors / faculty). This study sought to evaluate the social appropriateness of the use of the indicators as one way to achieve system-wide accessibility. A survey was used to gather information on respondents, ascertain their views on accessibility and institutional system change, and to evaluate the appropriateness of the GOALS indicators as a framework for institution-wide web accessibility. This information was used in the formative development of the final set of GOALS indicators. It is believed that this study added value not only to the products developed by Project GOALS but also helped us to gain insight into the prevailing (or current) attitudes and understanding of web accessibility across the three target groups.

Research Questions

The purpose of this study was to determine the extent to which the Institutional Indicators of Web Accessibility developed by Project GOALS were socially appropriate

for three different target groups. Specifically, I studied five research questions.

1. To what extent are the indicators **appropriate** for the purpose of providing a framework for web accessibility?
2. To what extent are the indicators **understandable** for the different target groups?
3. To what extent are the indicators **useful** for the different target groups?
4. What is the overall consumer **satisfaction** with the indicators for the different target groups?
5. To what extent are the indicators **comprehensive** enough to allow for differences across the different target groups?

Reporting

This dissertation is presented in a three-paper format. The use of this format provides a value added component to the traditional dissertation format, as it adds to the quality and usefulness of materials created for Project GOALS. Each paper will be submitted to a different journal and discusses different aspects of the research conducted on the Institutional Indicators. A matrix outlining the focus for each paper, relevant research questions, and the survey questions tied into each article is available in Appendix 3 (see Context for Analyses Matrices). A brief summary of the focus for each paper is provided below.

The first article is targeted toward administrators and discusses the reasons for the development of the Institutional Indicators with the goal of encouraging the readers to become advocates for web accessibility at their institution. It highlights the need for web accessibility in higher education and promotes the value of including enterprise-wide implementation of web accessibility in their evaluation and self-study schemas. It also

discusses the potential of large scale system change and promotes Project GOALS materials as tools to help achieve this end. This article was prepared for the *Online Journal of Distance Learning Administration* (OJDLA; (<http://www.westga.edu/~distance/ojdla/>)). This journal is a peer-reviewed journal offered via the Internet that focuses on issues related to distance education.

The second journal article focuses on development of the indicator document and the testing of the Indicators. It describes methodology of the study and discusses findings based on the statistical analyses performed on the data. It discusses the social validity of the Indicators and how the results of this study have impacted subsequent versions of the GOALS materials. This article was developed for publication in the *Journal of Special Education Technology* (JSET; <http://www.tamcec.org/jset/index.htm>). JSET is a refereed journal which publishes articles of interest to the special education technology field.

The final article discusses the differences found between the groups targeted by the study. As stated earlier, consumer satisfaction is an important part of social validation and product success. Therefore, understanding the applicability of the indicator document to the different target audiences will provide guidance to others wishing to develop accessibility materials and marketing strategies for the different groups. This article looked at the participant's experiences, understanding and attitudes regarding web accessibility and how the length of time a participant had been in their job impacted their responses. This article was created for *Educause Quarterly* (EQ; <http://connect.educause.edu/eq>). *Educause Quarterly* is an online peer reviewed journal for practitioners and managers of information resources.

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CHAPTER 2

REVIEW OF LITERATURE

While each of the articles in this multi-paper dissertation provides the necessary review of literature for that article, this section provides additional context for the overarching dissertation theme of web accessibility in postsecondary education and the theory behind the development of the Institutional Indicators evaluated in this study. This review highlights the importance (and relative absence) of web accessibility in postsecondary education. It then outlines the various laws and regulations that address web accessibility and discuss the ways in which legislation is struggling to keep up with technology. It also touches upon web specific standards that affect web accessibility and the groups that create them.

This review is followed by information on the importance of system change to achieve the goal of web accessibility.

Additionally, this review provides information relevant to the development of the Institutional Indicators. As the eventual direction of the GOALS work is to introduce the indicators into the accreditation and reaffirmation process, an overview of that process and how the indicators could be part of institutional self-study during cycles of accreditation or reaffirmation is included. It will also look at the use of benchmarking techniques (such as WCET's *Best Practices for Electronically Offered Degree and Certificate Programs described earlier*) as a way to help achieve it. Finally, the review looks at the principles and use of social validation as it is employed in this study.

Importance of Web Accessibility

The Internet offers the potential for unprecedented independence for persons with disabilities; sadly, much of this potential goes unrealized. Assistive technology allows people to access digital content whereas before they would have had to rely on others to access or read materials to them. For many of those with disabilities, taking advantage of the power of the Internet presents major problems. For example, websites are generally designed for people who use a mouse for navigation. However, people who are visually impaired may use screen readers and often navigate using their keyboards. Thus, sites that rely on visual information alone, rather than provide text alternatives, are impossible for someone using a screen reader to fully access or understand. Examples would include graphics and image maps on a site, or sites that are laid out using complex tables and frames. Furthermore, persons with fine motor impairments that must use an alternative switch to achieve keyboard access are unable to “point and click” with a mouse to navigate around those same pages. Users who are deaf have trouble with today’s websites too. Rich media content is useless unless that content is captioned (WebAIM, 2003).

Incidence

In 2005, approximately 12.6% of noninstitutionalized Americans between 21 and 64 reported some form of disability (Houtenville, Erikson, & Lee, 2007). Furthermore, an estimated 22 million (or 11%) of undergraduates (US Census Bureau, 2007) and 6.7% of graduate and first professional degree students (Institute of Education Sciences [IES], 2005) reported some form of disability during the 2003-4 school year. The US

Government Accounting Office (US GAO, 2009) estimates that the number of postsecondary students with some form of disability has grown from 9% in 2000 to almost 11% in 2008. While not every person with a disability is affected by web accessibility issues, it is estimated that 8.5% of the population has at least one disability that impacts computer and Internet use (Waldrop & Stern, 2003). This number may be even higher according to a study commissioned by the British advocacy group, Shaw Trust, which found that 17% of adults—almost 8 million people in the UK—may be affected by inaccessible websites (Shaw Trust, 2009).

As an ever-widening variety of higher educational activities has gone online, the opportunities for digital access have the potential to allow students with disabilities to participate in the educational experience in a manner equivalent to their non-disabled peers. However, poorly designed sites lacking web accessibility can create even greater barriers for those same people (WebAIM, 2004). Hackett and Parmanto (2005), in a study that used the *Wayback Machine* (<http://www.archive.org/index.php>) to evaluate websites over time, noted that while the complexity of websites had increased between 1997 and 2002, the accessibility of higher educational websites remained the same or decreased. A study by NCDAE (2008), found that in their sample of 100 postsecondary websites, 97% of their sample of second-level university pages contained accessibility errors. A study conducted at D'Youville College in 2008 found that in a sample of university homepages, 33% were noncompliant with even the basic W3C (World Wide Web Consortium) guidelines (Harper & DeWaters, 2008).

Web Use in Postsecondary Education

Online enrollment in higher education is growing at a substantial rate. Over 25% of students (about 4.6 million) enrolled in at least one online course during the fall of 2008—a 17% increase over the previous year (Allen & Seaman, 2010). This enrollment pattern is up from 3.5 million students enrolled in at least one online course during the fall of 2006 which was an increase of 10% over 2005 (Allen & Seaman, 2007). These numbers are even higher: according to Nagel (2009), the number of students taking online courses is expected to rise from the current 12 million to over 22 million by 2014 (Nagel, 2009). Furthermore, a 2007 study found that a third of students polled said that they would be willing to purchase electronic textbooks, 59% said they used online study aids, 78% used online quizzing, 29% took advantage of video tutorials, 16% participated in online study groups and 24% engaged in online tutoring (Nagel, 2007). Over 65% of college-bound students reported that the Web was more valuable than print resources in determining the postsecondary institution they wished to attend (in *Christian Science Monitor* as cited in Irwin & Gerke, 2004). This growing popularity of the Internet has made it essential for students to learn to use the Web to gather information not only for their studies but also for their everyday lives. Students with disabilities facing inaccessible sites are essentially blocked or severely limited in their opportunities to participate in the educational experience and learn essential Internet skills (WebAIM, 2004).

Dr. Cyndi Rowland, accessibility expert at Utah State University, summed up the importance of web accessibility:

First, it's the right thing to do, one should strive to treat all people in an equal fashion. Second, it's the smart thing to do. Economically, there is a large market of consumers one shuts out by denying accessibility. Furthermore, the same accessibility standards that allow users with disabilities to access your site also allow new technologies such as wireless handhelds to work. Finally, it's the law. By not complying, you risk losing funding, incurring fines, and having to do it anyway. (ASD, 2002)

Accessibility and the Law

The US has many protections in place to ensure that persons with disabilities receive equal treatment under the law.

Section 504

An amendment to the Rehabilitation Act of 1973—Section 504 was the first civil rights legislation in the US designed specifically to protect individuals with disabilities from discrimination based on their disability status. Any employers or organizations that receive federal financial assistance are required to adhere to a policy of nondiscrimination which stated that “No otherwise qualified individual with a disability in the United States...shall, solely by reason of her or his disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” All government agencies, federally funded projects, K-12 schools, and postsecondary entities (state colleges, universities, and vocational training schools) fall into this category (WebAIM, 2005). Today, many essential operations including test delivery, course administration and critical administrative functions such as financial tracking and student enrollment are migrating to an online infrastructure (Mariger, Rowland, Whiting, Christensen, & Rigley, 2010). If

those with disabilities are unable to access and use these online services, it affects their ability to fully participate, thus creating a discriminatory environment.

Section 508

In August of 1998, amendments to Section 508 of the Rehabilitation Act included a provision to ensure the accessibility of electronic and information technology for persons with disabilities who interact with federal agency content. Overseen by the Department of Justice, these amendments state that Federal departments and agencies that create, buy, use, or maintain electronic or information technology will assume responsibility for ensuring that all technology and information is available to those with a disability in a comparable manner as those without disabilities (Paciello, 2000, p. 33-34).

The standards required by Section 508 for the Internet were loosely based on the international standards set by the W3C Web Content Accessibility Guidelines (WCAG 1.0; Slatin & Rush, 2003, pp. 4-6). Currently, a refresh of the standards to Section 508 of the Rehabilitation Act and guidelines under Section 255 of the Telecommunications Act are under a period of public notice and comment by the Access Board. (The Access Board created this refresh by convening the Telecommunications and Electronic and Information Technology Advisory Committee [TEITAC], an advisory committee charged with evaluating the existing standards and guidelines and to recommend changes. The committee's membership included representatives from industry, education, disability groups, standard-setting bodies in the US and abroad, and government agencies [TEITAC, 2008]. This committee made their recommendations to the Access Board in May of 2008. New regulations are expected to be published sometime in 2010).

While Section 508 relates to Federal agencies, it has also been adopted by a growing number of states and higher education institutions through executive orders or administrative policies (Waddell, 2007). Furthermore, there is a growing push from governmental and funding organizations, for greater openness and access to the published results of research and the underlying data resulting from their funded studies (Lynch, 2008). Accessibility requirements are starting to appear in many requests for proposals (RFPs) and requests for applications (RFAs) for discretionary programs (Mariger et al., 2010). If websites and products necessary for research are not accessible, institutions may lose out on competitive grant opportunities.

The Americans with Disabilities Act

The Americans with Disabilities Act (ADA) was signed into law in 1990, making it illegal to discriminate against individuals with disabilities. Title I outlines prohibitions against discrimination in employment, Title II, states that communications with persons with disabilities must be “as effective as communications with others” [28 C.F.R. ss 35.160 (a)] and Title III, details the importance of nondiscrimination in a place of public accommodation for people with disabilities. Title III designates that “public accommodations must comply with basic nondiscrimination requirements that prohibit exclusion, segregation, and unequal treatment” (ADA, 2005). The ADA defines a place of public accommodation as a facility operated by private entity which has operations that affect commerce within one of 12 categories including places of education ranging from nurseries through postgraduate private schools (ADA, 2011). While the ADA was written using physical location terminology and perspectives, lawsuits such as the

National Federation of the Blind (NFB) v. Target, have expanded the rules to include virtual environments as well (Smith, 2006). This legal action has implications for education as the ADA further states: “Courses and examinations related to professional, educational, or trade-related applications, licensing, certifications, or credentialing must be provided in a place and manner accessible to people with disabilities, or alternative accessible arrangements must be offered” (ADA, 2005). It should be noted that the need for accessible websites goes beyond the needs of students; Section II of the ADA “prohibits all public entities, regardless of size of workforce, from discriminating in their employment practices against qualified individuals with disabilities” (ADA, n.d.). This legislation means that an institution is in danger of lawsuits and penalties if faculty and staff cannot access an institution’s website or inaccessible web software is purchased—where use is required within an employment setting. If employees are limited in their access to institutional information or potentially inhibited in their ability to perform critical aspects of their jobs, claims of discrimination can be made, if the accommodation results in outcomes that are not “timely” or communications that are not “as effective.”

Ongoing Change

Mandated accessibility is increasing over time and over a range of different environments. For example, the increasing popularity of the Internet in education is causing legislators to consider changes to the current regulations. In the spring of 2008, attempts were made through federal legislation to add language to the Reauthorization of the Higher Education Act to request that accrediting bodies address accessibility (C. Rowland, personal communication, December 2007). While this attempt did not come to

fruition, the issue is gaining ground through civil actions.

One of the early volleys in web accessibility litigation came from a corporate venue with the Target Corporation lawsuit (Frank, 2008). However, postsecondary entities are not exempt as shown in recent lawsuits including a suit against the Law School Admissions Council citing an inaccessible web site and Law School Admission Test (LSAT) preparation materials (Qualters, 2009); an action against Penn State University on behalf of students and faculty for a variety of inaccessible computer and technology services including inaccessible websites (National Federation of the Blind [NFB], 2010); and a 2011 suit against New York University (NYU) and Northwestern University for their adoption of web-based Google applications that present accessibility problems for students and faculty who are blind (NFB, 2011). This litigation extends to digital media beyond the web as well as evidenced by the Penn State Lawsuit as well as a June 2009 action by the NFB against Arizona State University for their use of the inaccessible Kindle DX as part of a pilot textbook program (NFB, 2009) with further suits against Case Western Reserve University in Cleveland, Pace University in New York City, and Reed College in Portland, Oregon, for the use of Kindles in the classroom (Department of Justice [DOJ], 2010). These lawsuits will most likely influence other areas of the academic and corporate arenas as well.

Additionally, in April of 2010, the Federal Communications Commission (FCC) released a paper on accessibility and technology, highlighting issues that must be addressed in order to ensure adoption and use of technology by persons with disabilities (Kimball, 2010). That same month, the Assistant Attorney General for Civil Rights,

Samuel Bagenstos, testified before the House Judiciary Subcommittee acknowledging the gap that exists between current legislation and technology while clarifying the intent of those laws:

Because the Internet was not in general public use when Congress enacted the ADA and the Attorney General promulgated regulations to implement it [the ADA], neither the statute nor the regulations expressly mention it. But the statute and regulations create general rules designed to guarantee people with disabilities equal access to all of the important areas of American civic and economic life. And the Department made clear, in the preamble to the original 1992 ADA regulations, that the regulations should be interpreted to keep pace with developing technologies. (Bagenstos, 2010)

This gap has also been recognized by the DOJ in its issuing of an “Advance Notice of Proposed Rulemaking on the Accessibility of Web Information and Services Provided by Entities Covered by the ADA.” As such, the department is considering options and reviewing resources and public comments regarding the updating of regulations for Titles II and III of the ADA to include web accessibility for persons with disabilities (DOJ, 2010). The notice closed for comments on January 11, 2001, with over 11,000 submissions (Regulations.gov, 2011).

Finally, in a June 2010 letter to college and university presidents, Assistant Attorney General Thomas Perez expressed concern over institutional use of electronic books such as the Kindle DX, which are not accessible to students who are blind or have low vision, noting that: “It is unacceptable for universities to use emerging technology without insisting that this technology be accessible to all students” (Dale, 2010).

W3C and Accessibility

The Internet is a decentralized entity. It is open to anyone with the ability to put

up content. This laissez-faire approach presents a problem when ensuring that the online content and programs can interact with the user and each other. In order to provide a base for interoperability of objects on the Web, the W3C was created (WebAIM, n.d.).

The World Wide Web Consortium (W3C), along with other groups and standards bodies, has established technologies for creating and interpreting web-based content. These technologies, which we call ‘web standards’, are carefully designed to deliver the greatest benefits to the greatest number of web users while ensuring the long-term viability of any document published on the Web. (Web Standards Group [WSG], 2008).

The W3C was created in 1994 by a founding father of the World Wide Web, Tim Berners-Lee, among others, to ensure that the Web remained open and interoperable and to provide a vendor-neutral forum for the development of web standards. Participants of the consortium come together from a variety of fields and from across the globe (Jacobs, 2008). There are currently close to 450 members of the consortium from technical fields, sales and service organizations, corporations, research bodies, and governments (WebAIM, n.d.).

Web standards apply to structural languages such as XHTML (extensible hypertext markup language), presentation languages such as CSS (cascading style sheets), object models such as DOM (document object model), scripting languages like EMCAScript (e.g., JavaScript), and others such as MathML (math markup language) and SVG (scalable vector graphics; WSG, 2008).

The W3C recognized the need to ensure accessibility to all users, including users with disabilities and, in 1997, created the Web Accessibility Initiative (WAI). This workgroup composed a set of accessibility standards and guidelines for web developers. These guidelines, published 2-years later, are known as the Web Content Accessibility

Guidelines 1.0 (WCAG 1.0). WCAG has been the basis for a number of accessibility policies and laws across the US and the world (WebAIM, n.d.).

WCAG 1.0 was based on a set of 14 guidelines with “checkpoints” under each guideline. These checkpoints were each assigned a level or priority. There were three priority levels—priority one being items that are essential if web content is to be accessible, priority two being items that should be addressed, and priority three being things that may also be addressed to enhance the user’s experience.

As the Web evolved, new issues needed to be addressed and in 2005, a working draft of WCAG 2.0 was released for comment and has now replaced WCAG 1.0. This version eliminated the priority scheme and introduced success criteria for minimum, moderate, and maximum implementation making verification of conformance considerably easier and less ambiguous. Additionally, the criteria have been refocused from 14 guidelines to four principles. These top level principles are identified as “POUR” perceivable, operable, understandable, and robust (WebAIM, n.d.). The WebAIM website (n.d.), described POUR as:

Content must be made available to users in a format that they can perceive with at least one of their senses (i.e., sight, hearing, touch). It must be presented in a way that they can interact with or operate it with either standard or adaptive devices. It must be presented in a way that the user can understand or comprehend. Finally, content must be presented using technologies and interfaces that are robust enough to allow for disability access, whether natively or in alternative technologies and interfaces. Together these principles address all areas of accessibility, at least in broad conceptual strokes.

It should be noted that websites developed following W3C guidelines require less bandwidth, are easier to maintain and update, maintain their integrity as technologies evolve (forward compatible), and are compatible with newer browsers (WSG, 2008).

World Wide Web Accessibility

The requirement for accessibility extends beyond the borders of the US. For example, in 2004, a British tribunal ruled that a US company with no physical presence in the UK was still liable under the UK's Disability Discrimination Act (DDA), which requires that all websites (public and private) meet accessibility standards (Out-Law.com, 2007). This rule may signal that US institutions that wish to interact and compete in the UK, and an increasingly global market, must ensure websites meet the accessibility standards of every country with whom they collaborate. This international imperative is further emphasized by the United Nations' Convention on the Rights of Persons with Disabilities, which was adopted on December 13, 2006. The convention specifically addresses the accessibility of information and communication technologies (ICTs) for all sectors, *including education* as an enforceable legal instrument (Leblois, 2008). The US became a signatory on July 30, 2009; as of November 2010, the convention has been signed by 147 countries and been ratified by 96 making it a legal instrument in those countries (Global Initiative for Inclusive ICTs [G3ict], 2009; United Nations, 2010).

System Change

As web accessibility garners increased importance and attention, there is greater emphasis on making system-wide, rather than individual, changes in our efforts to create a more accessible world. This [action] is accomplished through policy setting and implementation that places the importance of web accessibility alongside other web considerations. (Rowland & Mariger, 2007)

System-wide engagement is necessary to create change for diversity in an institution (Chan, 2005). Since the GOALS document intended to outline what is needed

to achieve system change, it was developed as a way to look at those factors or issues that could assist the institution in enterprise-wide change. As noted earlier, individual efforts to promote web accessibility can create hit-and-miss web accessibility across an institution and an accessible web presence requires enterprise-wide engagement.

According to Rabuzzi, Carson, and Conklin (2001), in order to achieve and sustain system change, highest level leadership and commitment is essential. Other important aspects include: use of a high-profile champion; a focus on students; innovating on the margins and working outside the mainstream system; systemic thinking; capturing the legislature's attention; delegation of authority; increasing accountability; benchmarking performance; the use of financial incentives; controlling the message; telling the story; seeking allies outside the academy; linking with K-12; and staying close to the state budget office.

Peterson (2005) recommended a two-prong approach to system change: the Top-Down approach where change is initiated at the highest level, setting procedures and incorporating standards and language into the policies of the system; and the Bottom-Up approach utilizing individual entities or departments as champions that can innovate, test and show others how to do it. However, without administrative support, sustained change is unlikely and a lack of system-wide accountability and incentives for excellence can stymie system change (Rabuzzi et al., 2001).

Faculty resistance and institutional culture can be a barrier to change (Berge, 1998). It is important to understand the underlying assumptions and ideologies of the various institutional groups when planning change through policy. Often policies are

pitted against embedded institutional norms making them hard to carry out. Therefore, it is important to include discussions with these different groups and consider an implementation strategy as part of the policy development process (Chan, 2005).

An analysis of system change in higher education institutions across Europe found that external quality assessment and peer review have changed the basic power structure in academic institutions shifting from an individual focus to an institution-based one and that growing administrative and marketing concerns in higher education venues tend to emphasize extrinsic values over the more traditional intrinsic values of academia (Brennan & Shah, 2000). As Marshall, Mitchell, and Beames (2007), noted:

The need for organizations to be responsive to change has been recognized for many years and is a staple of the business restructuring and re-engineering gurus and their endless books. Universities seem to have ignored much of this [need], safe and secure in their roles as researchers and teachers. University restructuring has tended to be an unpleasant necessity forced upon us by changing student interests in particular disciplines or wider economic trends, and our responses have been limited to the barest minimum needed.

While this resistance to change is entrenched in many (if not most) institutions, some are starting to recognize the need for change. This shift in attitude can be seen in the large-scale efforts of individual intuitions as well as entire systems that are starting to require an accessible web presence.

Large-Scale Accessibility Initiatives in Higher Education

Many individual institutions in US higher education such as the University of Arizona, Ohio State University, Oregon State University, the Massachusetts Institute of Technology (MIT), and the University of Wisconsin at Madison have enterprise-wide

web accessibility policies. These policies are publicly posted and contain specific outlines for compliance (e.g., timelines, standards, purchasing guidelines and mechanisms for enforcement) as well as a wealth of resources that can assist individuals in these organizations in meeting them (Johns Hopkins University [JHU], 2008; University of Washington [UW] Technology, 2008).

Full systems of education are likewise seeing their affirmative obligation to have an accessible web presence. Two sample efforts are the California Community College and the California State University System: In 1996, the US Department of Education, Office of Civil Rights began a review of the California Community College system under Title II of the Americans with Disabilities Act in order to ascertain if there was evidence of systematic discrimination against students with visual impairments. As a result, the Chancellor's task force on distance learning (which included the California Virtual University) assigned members who were to focus specifically on access issues for persons with disabilities. In 1999, the task force implemented guidelines for providing access for students with disabilities. These guidelines incorporated legal requirements at both a state and federal level and provided specific strategies for ensuring access across specific modes of distance delivery using the WCAG 1.0 as a template for web design (Chancellor's Office, California Community Colleges, 1999). A second example of top-down system-wide change began in 2005 when the Chancellor of the California State University System issued Executive Order 926 enacting policies that would require that all information and technology services to be accessible to all students, faculty and staff system-wide regardless of disability (Reed, 2004). As part of the implementation, the

Accessible Technology Initiative (ATI) set three priorities with timelines for each of the 23 campuses to follow. Priority One covered web accessibility (including legacy pages) by May 2008 (Rowland & Mariger, 2007). However, this agenda was discovered to place an undue burden on the campus systems and the timeline was extended to May 2012 (Reichard, 2007).

These individual and large-scale efforts help to support the argument that system change is possible and that it requires support and involvement from the top.

Accreditation

As the GOALS document is intended as a beginning point for institution-wide self-study, it was important to look at the contexts in which those in postsecondary education engage in system wide self-study. Accreditation is an important and well recognized area which utilized self-study. Understanding how GOALS could capitalize on the inherent motivation for self-study and continuous improvement was important. “Accreditation is a trust-based, standards-based, evidence-based, judgment-based, peer-based process” (Eaton, 2006). According to Wikipedia (n.d.a);

Accreditation is a type of quality assurance process under which a facility’s or institution’s services and operations are examined by a third-party accrediting agency to determine if applicable standards are met. Should the facility meet the accrediting agency’s standards, the facility receives accredited status from the accrediting agency.

In higher education, accreditation is a voluntary self and peer review process which has been in practice in the US for over 100 years (CHEA, 2006a). While accreditation is voluntary, accredited status serves to demonstrate the legitimacy and

quality of educational schools and programs (CHEA, 2006b) and is highly sought after. Accreditation also makes it easier for students to transfer credits to other institutions and serves to engender confidence in the students as qualified employees by potential employers once they have graduated (Eaton, 2006). Furthermore, in order to receive federal funding, an educational institution must be accredited by a recognized accrediting agency. In 2006, there were 6,814 accredited institutions and 18,152 accredited programs in the US (CHEA, 2006a).

The increase of online “diploma mills,” schools which provide diplomas in exchange for money and little work, has made the need for accreditation even greater. In order to be eligible for financial aid services, a school must be accredited by a recognized accreditation agency (Ed.gov, 2005).

Accreditation in the US is performed by one of 80 nonprofit accreditation organizations. There are four types of accreditors: regional, faith-based, private career-based, and programmatic (Eaton, 2006). Most elementary, junior high, middle, and high schools, as well as public and private institutions of higher education that are academic in nature, are overseen by the six regional accreditation agencies (Wikipedia, n.d.b). These regional accreditation agencies review entire institutions, most of which (over 97%) are non-profit and degree granting. According to Wikipedia (n.d.b), the six regional accreditation organizations include:

- Middle States Association of Colleges and Schools (MSA)
- New England Association of Schools and Colleges (NEASC)
- North Central Association of Colleges and Schools (NCA)
- Northwest Commission on Colleges and Universities (NWCCU)
- Western Association of Schools and Colleges (WASC)
- Southern Association of Colleges and Schools (SACS)

In 2006, these six regional agencies oversaw the accreditation of 2,986 institutions in the US (CHEA, 2006a).

Accreditation is an ongoing, cyclical process. Once an institution earns accreditation status, they participate in periodic reviews in order to maintain their status. This process involves several steps. The first step is self-study where the institution prepares a written summary of performance based on the standards of their accreditation agency. Second is a peer review of evidence materials and documents conducted by faculty and administration of similar institutions. Third, a site visit by the reviewers to view the institution and programs first hand. Next is the Judgment by the accrediting organizations commission who decide, based on the other steps whether the institution or program meets the requirements for accreditation or re-accreditation. Finally, periodic external reviews are conducted over time (Eaton, 2006).

It should also be noted that accreditation agencies are also subject to oversight since they undergo periodic external review of their organizations known as “recognition.” While accreditation is voluntary, recognition is not. Recognition is performed by either the CHEA (a national coordinating body for national, regional, and specialized accreditation) or the United States Department of Education (USDE; Eaton, 2006).

Accreditation encourages institutions to improve quality, increase effectiveness, and endeavor for ongoing excellence (Martin, Manning, & Ramaley, 2001). A first step in this process is the self-study. The CHEA (2002) defined self-study as:

The review and evaluation of the quality and effectiveness of an institution’s own academic programs, staffing, and structure, based on standards set by an outside

quality assurance body, carried out by the institution itself. Self-studies usually are undertaken in preparation for a quality assurance site visit by an outside team of specialists. Results [are reported] in a self-study report.

Self-study is part of the accreditation process which helps an institution provide confirmation of their efforts to promote and maintain quality within the organization. Martin and colleagues (2001) found that in addition to verifying an ongoing commitment to quality, the self-study process can be used as a catalyst for strategic change within an organization and can bring together diverse university subcultures often with opposing positions on issues to work towards common and agreed upon outcomes. Through a shared commitment, administration can engage faculty members in administrative activities that were crucial to the institution, could not be achieved without their support and were not traditionally considered within their purview (Martin et al., 2001). Thus, the use of self-study to achieve institution-wide web accessibility was considered to be a viable strategy in the planning and development of the Indicators document.

Use of Benchmarking for System Change

One mechanism often used for institutional self-study is evaluation of benchmarks. Benchmarking bears many similarities to self-study in the accreditation process. Alstete (1995) defined benchmarking as

an ongoing, systematic process for measuring and comparing the work processes of one organization to those of another, by bringing an external focus to internal activities, functions, or operations. The goal of benchmarking is to provide key personnel, in charge of processes, with an external standard for measuring the quality and cost of internal activities, and to help identify where opportunities for improvement may reside.

Benchmarking provides a process in which best practice is identified and used as

a tool for learning and continuous quality improvement (Oakland & Tanner, n.d.). Successful benchmarking requires an investment in time and resources, especially from senior management (Marshall et al., 2007). According to Bender (2002), “Institutional evolution through planned change processes is an organizational imperative.” In order to survive, leaders and workers in institutions must continuously evaluate their organization’s structure and procedures. Benchmarking can be used to help transform institutional culture and overcome resistance to change.

Within the umbrella of benchmarking, there are many strategies and techniques including total quality management (TQM), continuous quality improvement (CQI), and business process reengineering (BPR; Alstete, 1995). TQM is a philosophy of total quality improvement with three basic tenants: defining quality, improving the organization’s work performance (or “technical system”), and improving its administrative system (Chaffee & Sherr, 1992). Academic programs such as the Academic Quality Improvement Program (AQIP; American Universities International Program [AUIP], 2008) follow a very similar program of quality improvement:

The Academic Quality Improvement Program infuses the principles and benefits of continuous improvement into the culture of colleges and universities by providing an alternative process through which an already-accredited institution can maintain its accreditation from the Higher Learning Commission. With AQIP, an institution demonstrates it meets accreditation standards and expectations through sequences of events that align with those ongoing activities that characterize organizations striving to improve their performance. (AUIP, 2008)

Marshall and colleagues (2007) pointed out that, in addition to driving change, benchmarking can create a wide variety of potential outcomes including: identifying and establishing standards of excellence, a structure for keeping abreast of best practices, a

mechanism for measuring an institution's performance against world class institutions, a framework for establishing performance goals and quality improvement projects, a method for motivating staff and encouraging innovation, and a template for finding, recording and adapting practices to individual organizations (Marshall et al., 2007). Thus, the GOALS document elected to employ a strategy to embed benchmarks within each indicator.

However, before benchmarking programs or other best practice systems can be established as viable, they need to be tested, assessed, and validated. One method that can be used for this purpose is social validation.

Social Validation

The purpose of social validation is to obtain a subjective evaluation of a product or intervention direct from the users or clients (Wolf, 1978). Acceptability of the product or intervention can be assessed using a number of dimensions: acceptability of the focus of the product or intervention, the acceptability of the procedures used by the product or intervention, and finally, the importance of the behavior change elicited by the product or intervention. These assessments are done using the consumers of the product or intervention as evaluators.

Wolf (1978) stressed the importance of including the consumer in the evaluation process as customer acceptance of a product or intervention is often the deciding factor in its success or failure. "Researchers are educated by the consumers of their products regarding the good and bad features and the desirable and undesirable outcomes"

(Finney, 1991, p. 246). Winett, Moore, and Anderson (1991) found that social validation was valuable for pilot and formative evaluations as it is able to help refine a product and aids in determining the appropriate audience for it.

Consumer satisfaction is an important measure of social validity that can provide far-reaching value—by including potential consumers in the evaluation, not only can you improve your product, you also provide a basis for its marketing (Gresham & Lopez, 1996).

Social validation can provide value far beyond the limits of an individual research project. Social validation can be used to assess the social acceptability of a program. It can also assess whether the changes the program is seeking to make are important to customers (Kazdin, 1977). Francisco and Butterfoss (2007), posit two questions that should be considered in the context of social validation: Are we targeting a concern that is shared by an audience and does the community value our goals as important to them?; and, are the outcomes felt by the broader community and does the broader community value these outcomes? By participating in social validation, stakeholder perceptions can help to establish the level of social importance of an intervention (Gresham & Lopez, 1996). Social validation can also be used as a vehicle to involve consumers in setting an agenda for action, establishing research objectives, and informing decision makers about the importance of social goals (Fawcett, 1991).

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CHAPTER 3

WEB ACCESSIBILITY: NOT JUST FOR TECHIES ANYMORE¹

Abstract

The Internet is an integral part of higher education today. Students, faculty and staff alike must have access to the institutional web for essential activities. If an institution's web presence is not accessible to those with disabilities, their ability to perform critical tasks and activities can be severely limited. An accessible website affects a wide range of constituent groups including students, faculty, staff, prospective students and alumni. Furthermore, ensuring web accessibility provides additional value as it:

- Aligns with most institution's missions and core values,
- Is a good return on investment and helps with public relations and fundraising,
- Promotes collaboration and funding efforts, and
- Can provide protection from legal complaints.

Ensuring an accessible web presence requires leadership and vision from administrators and those with the power to mandate change. To assist administrators with this process, Project GOALS has developed a set of materials and processes specifically tailored for postsecondary institutions. One of these products, a set of "institutional indicators" outlines recommended practices for web accessibility in education. This set of indicators was evaluated using social validation methods to determine if the document was appropriate for providing a framework for web accessibility.

¹ This paper is coauthored by Cyndi Rowland and will be submitted to the *Online Journal of Distance Learning Administration*.

Ninety-seven participants including 31 administrators, 33 faculty, and 33 technology specialists reviewed the document and completed an online questionnaire rating the document. Using a series of Likert-style questions on a 7-point scale (1 indicating the lowest score and 7 indicating the highest), participants rated the appropriateness of the indicators for use at both their institutions and other institutions. Overall rating means ranged between 5.98 and 6.20 with the administrator group tending to rate the indicators slightly lower than the faculty or technology specialists. All three groups rated the indicators as more appropriate for other institutions than their own. However, the results of the study would indicate that all four indicators appear to be appropriate for the purpose of providing a framework for web accessibility.

Introduction

The Internet has become an integral part of higher education today. From choosing a school through graduation and beyond, the web is used by students, staff and faculty alike for everything from online learning to critical administrative functions. Most traditional courses now have online components. Moreover, online engagement in higher education is growing at a phenomenal rate. The number of students taking online courses is currently estimated at over 12 million and is expected to rise to over 22 million by 2014 (Nagel, 2009). However, for the 8.5% of the population that have at least one disability that impacts computer and Internet use (Waldrop & Stern, 2003), inaccessible websites can inhibit or severely restrict their participation as students, faculty or staff in postsecondary settings.

For those with disabilities, computers and the Internet can be a boon. Assistive technologies can provide access to information and services that were impossible a generation ago. Digital media can help students, faculty, and staff with disabilities participate in higher education on the same footing as their peers (US GAO, 2009). However, this newfound independence can be hampered by inaccessible web content. While the complexity and sophistication of the web has increased over the years, the accessibility of postsecondary websites has shown little improvement (Hackett & Parmanto, 2005). Studies conducted in 1999 and 2008 revealed the same disturbing results; in both cases, accessibility issues were found on over 97% of sample webpages one click from the institutional homepage (NCDAE, 2008; Rowland & Smith, 1999). This inaccessibility persists despite a heightened awareness of the problem and numerous resources aimed at increasing web accessibility in education (Craven, 2006).

Leadership and support are cited as key elements in any institution-wide transformation (Rabuzzi, Carson, & Conklin, 2001). As such, it is becoming evident that administrative leadership is vital to the advancement and maintenance of an institution-wide accessible web presence. If administration is to lead this effort, it is crucial that they understand the importance of web accessibility and its value to an institution.

The purpose of this article is twofold: first, to provide the reader with a framework or rationale regarding the benefits and value of an institution-wide web accessibility initiative and second, to discuss the development and evaluation of a set of Institutional Indicators created to assist institutions to plan for, improve, and maintain institution-wide web accessibility.

Web Accessibility Versus the Accommodation Model

Postsecondary institutions are legally required to supply reasonable accommodations for students under Section 504 of the Rehabilitation Act (Office for Civil Rights [OCR], 2006), and for employees and other community members under Titles II and III of the ADA (2005). A reasonable accommodation is offered to a qualified individual who requests it, if their disability prohibits access for education, employment, or discrimination in a place of public accommodation.

However, accommodations for inaccessible web content are often made after-the-fact when the student or faculty requests them. This disparity can lead to both an inefficient use of resources as web content is created, and then recreated or repurposed to provide access to only those who have requested it and an inequitable situation for those who must now wait for the fixes. Often accommodations take time and those with disabilities must rely on disability services' working schedule and the workload of others while their peers can access necessary information at any time of the day or night. When these delays happen individuals with disabilities lose some of their independence and the timeliness of content delivery is jeopardized (Waddell, 2004). When after-the-fact web accommodations occur, they often have a negative effect on student and employee outcomes and productivity. Furthermore, as Kuusisto (2009) noted, the "rehab" model of disability where administrators can hand off responsibility for accessibility to disability services is outdated, students with disabilities are no longer willing to wait for access or to be treated as second-class citizens. Because of this, accessibility has become a recent focus of legal complaints for both students (under Section 504 of the Rehabilitation Act)

and faculty and staff (under the employment provisions of the ADA; Rowland, 2006, 2011). The Office of Civil Rights (OCR) emphasizes the obligation of institutions of higher education to develop an accessible technology plan and states that *“the courts have held that a public entity violates its obligations under the ADA when it only responds on an ad-hoc basis to individual requests for accommodation”* (Waddell, 2007). This sentiment is echoed in a June 2010 letter to college and university presidents from Assistant Attorney General Thomas Perez expressing concern over institutional use of electronic books such as the Kindle DX which are not accessible to students who are blind or have low vision, noting that *“It is unacceptable for universities to use emerging technology without insisting that this technology be accessible to all students”* (Dale, 2010).

In April of 2010, the released a paper on accessibility and technology, highlighting issues that must be addressed in order to ensure adoption and use of technology by persons with disabilities (Kimball, 2010). That same month, the Assistant Attorney General for Civil Rights, Samuel Bagenstos testified before the House Judiciary Subcommittee acknowledging the gap that exists between current legislation and technology while clarifying the intent of those laws:

Because the Internet was not in general public use when Congress enacted the ADA and the Attorney General promulgated regulations to implement it, neither the statute nor the regulations expressly mention it. But the statute and regulations create general rules designed to guarantee people with disabilities equal access to all of the important areas of American civic and economic life. And the Department made clear, in the preamble to the original 1992 ADA regulations, that the regulations should be interpreted to keep pace with developing technologies. (Bagenstos, 2010)

This gap has also been recognized by the Department of Justice who has issued an

“Advance Notice of Proposed Rulemaking on the Accessibility of Web Information and Services Provided by Entities Covered by the ADA.” As such, the department is considering options, reviewing resources and public comments on updating the regulations for Titles II and III of the ADA to include web accessibility for persons with disabilities (DOJ, 2010). This notice closed in January with over 11,000 public comments (Regulations.gov, 2011).

The need for many after-the-fact accommodations to the web can be eliminated through accessible design from the outset. Websites designed to be accessible from the beginning not only provide better value for students, faculty, and staff with disabilities, they are more efficient, allowing those tasked with providing accommodations to focus on special needs rather than having to spend time and limited resources on fixes that could easily have been incorporated when creating the site. Furthermore, current web standards endorsed by the W3C’s Web Accessibility Initiative (WAI) workgroup require that accessible content be developed from the beginning (WAI, 2008). It should also be noted that accessible design does not need to affect the quality or the look and feel of an institutional web site or that of its programs (Bohman, 2004).

Web Accessibility Affects Everyone!

An institution’s website is its link to the world. It is used not only by students and faculty, but also alumni who want to keep or maintain ties with their alma mater. It is also most likely to be the first impression that potential students and staff will have when making a decision on schools, jobs or donations.

Students

As mentioned earlier, estimates are that 8.5% of the population has a disability that interferes with Internet use (Waldrop & Stern, 2003). While there is no specific estimate of the number of students affected by inaccessible websites, it would surely include most of the 22 million undergraduates (US Census Bureau, 2007) and 189,000 graduate and first professional degree students (IES, 2005) who reported some form of disability during the 2003-4 school year. Those students need to be able to register, take tests, and access the resources and materials necessary to participate in their courses in a timely and equitable manner. Moreover, a 2008 survey found that 93.4% of students reported using the college or university website on a weekly basis and that that students spent an average of 19.6 hours a week doing online activities for work, school or recreation (Caruso & Salaway, 2008). If students are unable to access web-based materials at the same time as their peers, or if they must wait for after the fact accommodation of institutional processes (e.g., registration, financial aid, student employment, housing options, courses or assessment content), the consequences can be severe. Inaccessible web content affects timeliness, student experience, and student learning, which in turn can affect student success, outcomes, satisfaction, and persistence.

Faculty and Staff

The Internet is an essential part of most day to day operations for faculty and staff as well as students. Many academic functions including test delivery and course administration are now handled through online learning management systems. The use of tools such as blogs, wikis, podcasting and social networks are on the rise. A study by the

Economist Intelligence Unit (2008) revealed that 63% of those surveyed believed that “...technological innovation will have a major influence on teaching methodologies over the next five years. In fact, technology will become a core differentiator in attracting students and corporate partners” (p. 4). Additionally, critical administrative functions such as hiring personnel, financial tracking, grading, and student enrollment are now handled online. Current statistics indicate that 4.9% of those employed in education, training and library services have some form of disability (Smith & Clark, 2007). These faculty and staff must be able to access these programs along with a host of online information and materials without having to wait for accommodations or rely on others to assist them.

Prospective Students and Employees

Institutions put a great deal of time and money into recruitment and retention efforts for new students and employees. For example, a 2005 study found that 4-year colleges reported costs to recruit a single student ranged from \$400 to over \$2,000 (Noel-Levitz, 2006). Over the past decade, the web has become an important tool for recruitment. In 2004, over 65% of college bound students reported that the web was more valuable than print resources in determining the postsecondary institution they wished to attend (in *Christian Science Monitor* as cited in Irwin & Gerke, 2004). A 2006 Pew Internet study found that 42% of Americans said that the Internet played a major role as they decided on a college for themselves or their children, and 14% said that the Internet played a major role as they switched jobs (Horrigan & Rainie, 2006).

The number of students with disabilities seeking higher education is on the rise.

According to the GAO, students with conditions such as autism, psychological disabilities, and chronic medical conditions as well as veterans with newly acquired disabilities are the fastest growing populations in the postsecondary arena. With the enactment of the Post-9/11 GI Bill, school officials are anticipating an even greater increase in the number veterans with disabilities seeking postsecondary education (US GAO, 2009). Institutions who wish to compete in a changing market would do well to make web accessibility a priority. Given the significance of an institution's website in the recruitment of potential students, faculty, and staff, a website that exhibits an understanding and concern for the needs of their students and employees with disabilities is more likely to attract and retain those they wish to recruit.

Alumni and Community Members

The institutional website can be a portal for community and alumni relations. Those looking for information on institutional activities, such as programs and sporting events are likely to turn to an institution's website to find the information that they need. Moreover, the Internet can be a valuable tool for fundraising and development. A Council for the Advancement and Support of Education (CASE) survey reported that the 100 schools responding to their survey raised over \$4.8 million online (Kipps, n.d.). If those who seek opportunities to assist their alma mater or local institutions are aging, they are more likely to personally experience many aspects of disability or diminished function (Slatin & Rush, 2003). This possibility makes accessibility an ongoing concern for institutions who wish to engage alumni and community members to maintain an interest in their institution.

Web Accessibility Aligns With Institutional Mission and Strategic Planning Initiatives

An institution's mission statement represents its values and priorities, helping to map its path well into the future. According to *Diversity Digest*, 63% of colleges and universities have a diversity element included in their mission statements (Meacham & Barrett, 2003). By developing and providing an accessible web architecture, an institution provides support for a large segment of one of the largest minority groups in the world thus providing a tangible proof of that institution's commitment to diversity.

Web accessibility can also align with efforts towards continuous improvement and an institution's strategic planning initiatives. The standards and criteria of all six regional accrediting bodies that represent higher education underscore issues such as: providing quality education and services to *all* students; a policy of non-discrimination; a focus on public service; support for lifelong learning; and an emphasis on ethics and integrity (Mariger, 2008). As such, web accessibility can effectively be incorporated as part of a system of self-study and continuous quality improvement or other initiatives recognized during the accreditation or reaffirmation process.

Web Accessibility Is a Good Return on Investment

Ensuring an accessible web presence is practical from a financial aspect as well—in the physical world, it is far more cost effective to incorporate accessible design features, such as ramps and accessible bathrooms, from the beginning than trying to retrofit these features later. Similarly, designing a website to be accessible from the

beginning is easier and less expensive than having to make changes or create new documents each time a request is made. Furthermore, a British financial firm reported that after making a website accessible, search engine referrals increased 28% in the first 24 hours, site maintenance costs decreased by 66% and they achieved a 100% return on investment (ROI) in 12 months (Sims, Smith, & Whiting, 2009).

The growth rate of the electronic learning products and services market (including content, learning platforms, authoring software and hosting tools) is expected to jump from the current \$16.7 billion to almost 24 billion by 2014 (Nagel, 2009). As the number of options for postsecondary education grows, those tools and services that serve everyone without additional expenses for accommodation will likely emerge as the financial leaders.

Furthermore, a 2009 study found that 45% of institutions surveyed reported institutional profits from their online initiatives and almost half indicated that tuition for online students is higher than that of on-campus students (Green, 2009). By limiting the accessibility of these courses, an institution limits potential revenue.

Development and Public Relations

An accessible web presence promotes an institution as socially responsible and engaged with the needs of the community and society at large. As such, it is good publicity. It can highlight an institution's commitment to diversity and serves as evidence of the quality of its work. The development of an institution-wide plan for web accessibility can serve to enhance an institution's public relations across campus and beyond.

In addition to the obvious public relation benefits, the trend toward online donations is growing at an impressive rate. A 2005 study found that over 65% of donors gathered information from the Internet before making a donation decision. Moreover, a 2009 study found that over half of donors prefer to use the Internet for donations and that 46% plan to make an even greater share of their donations over the Internet in the future (Long, 2009). Studies have also found that online donors tend to be more generous and many of those who donate online do not have a prior history of donating with an organization (Kipps, n.d.). As stated earlier, as people age, they are more likely to experience many aspects of disability or diminished function (Slatin & Rush, 2003, p. 126). A website that is accessible to all and easy to use by aging populations can be a powerful tool in development. It can be used by venerable alumni and community members, both of whom are potential sources for development and fundraising.

Accessibility Requirements for Funding Entities

Requirements for accessibility are beginning to appear in grants and contracts. These requirements are happening in some discretionary programs funded by many sources, including the US federal government, state governments, international governments, and private foundations. Research faculties as well as offices of sponsored programs should be aware that some requests for proposals specifically ask for accessibility information and that some award contracts now specify requirements for digital accessibility. Furthermore, funding organizations are pushing for greater access to all funded activities (Lynch, 2008). If the accessibility of web content and resulting

digital products from research are not addressed, institutions may not be as competitive in some discretionary programs. Moreover, if this requirement is ignored, an institution could be in violation of the terms of an awarded contract.

Collaboration and Embracing the Future

As postsecondary institutions face repeated economic challenges, rising costs and diminishing funds become part of the institutional fabric. Finding ways to improve efficiency and share costs while maintaining quality is essential to the survival of the postsecondary system. Many institutions have embraced collaborative efforts as a way to stretch limited resources. Faculty sharing and course delivery arrangements are now part of regional educational collaboratives such as WICHE's ICE (Internet Course Exchange) (wiche.edu/ProSvcs/ICE) and SREB's Electronic Campus (www.electroniccampus.org/). They provide a venue to disseminate and administer courses across their member institutions.

In order to participate in these collaborative efforts, courses and materials need to be created to the standards required by members of those collaboratives. An institution will not be able to use materials or sponsor a course that does not conform to that institution's policies and guidelines. These guidelines often include web accessibility. As institutions and even entire educational conglomerates (such as in California where both the Community College and the state university systems require adherence to Section 508) enact policies mandating web accessibility to specified standards, those institution's with courses or educational materials that do not meet these criteria may find their collaboration opportunities limited. Furthermore, if an institution does receive a course

that is not accessible, they must then spend valuable time and resources working to fix the course or make accommodations for the student or employee. These fixes are an inefficient use of limited resources and may create friction between institutions that can affect future collaborations.

The demand for web accessibility moves from individual policy to legal imperative beyond the borders of the United States. Many countries including the UK, Australia, New Zealand, Canada, Mexico, Japan, and the European Union (W3C, 2008) have regulations requiring web accessibility for any content used within their borders—even if the content is created and housed elsewhere (Out-law.com, 2007). Emphasizing the international importance of full inclusion is the United Nations' Convention on the Rights of Persons with Disabilities, which was ratified on December 13, 2006. The US became a signatory on July 31, 2009 (UN News Service, 2009). The convention specifically addresses the accessibility of information and communication technologies (ITCs) for all sectors, *including education* as an enforceable legal instrument (Leblois, 2008). As of November 2010, the convention has been signed by 147 countries and been ratified by 96 parties making it a legal instrument in those countries (UN, 2010). US Institutions, who wish to interact and compete in the UK and in an increasingly global market, must ensure websites meet the accessibility standards of every country with whom they collaborate (Sanford University Accessibility Program, 2006).

Protection from Legal Complaints

An institution with an inaccessible web presence is in danger of becoming the target of a complaint or lawsuit (or multiple lawsuits), which, regardless of the outcome

could result in negative publicity and cost the institution time, money and valuable resources. The US has many protections in place to ensure that persons with disabilities receive equal treatment under the law. Students, staff, and faculty with disabilities are more informed than ever regarding these laws and their civil rights. Activists and advocate groups are effective in securing equal participation in higher education. Litigation on this issue has already been taken against postsecondary entities including recent lawsuits against the Law School Admissions Council citing inaccessible LSAT preparation materials (Qualters, 2009); Arizona State University (NFB, 2009), Case Western Reserve, Pace University and Reed College the use of inaccessible Kindles (US DOJ, 2010); Penn State University for a variety of inaccessible computer and technology services (NFB, 2010); and New York University (NYU) and Northwestern University for their adoption of Google Applications (NFB, 2011). While an institution-wide commitment to web accessibility does not guarantee protection from complaints or suits, an active and enforced policy shows good faith and may help to mitigate the effects.

Web Accessibility Provides Benefits Beyond Those for Persons with Disabilities

Accessible web content offers benefits beyond students and employees with disabilities. For example, in the physical world, curb cuts—the breaks in sidewalks that allow wheelchair access—are also useful for parents with strollers, people with carts, skateboarders, cyclists and many others (Slatin & Rush, 2003, p. 124). In a virtual environment, accessibility features are useful for many groups as well. For example, the

application of digital media and captioning of web-based video content provides multi-modal support for different learning styles and helps index content so it can be searched. Captioned media can also be of value in noisy environments, by those without computer speakers or headphones, or in situations when sound and noise is prohibited such as in a library or lab. Captioning can also help promote further diversity, by helping students for whom English is a second language to improve both understanding of the content and overall language skills (University of Wisconsin-Madison [UWM], 2008).

Web Accessibility Enhances Other Web Technologies

Accessible web pages can promote technology innovation on campus. It has been noted that Google and other search engines access the web in the same way that users who are blind do “Google is blind and reads your sites linearly—as the code is sent to the browser—and then tries to interpret what it “sees” (I like to use the analogy that it reads your site like blind people read using Braille)” (Flanders, n.d.). Thus, accessible content tends to have a higher return on prominent search engines (Hagans, 2005). By ensuring a website is accessible, an institution helps to ensure that the net’s most powerful web user (Google) can index its site. Accessible content is also generally more standards-conformant and, as a result, page content generally loads more quickly in browsers, requires less bandwidth, and is easier to maintain and update. Standards compliant websites also maintain their integrity as technologies evolve (forward compatible), and are compatible with newer browsers (WSG, 2008), thus the resources required for search engine optimization can be reduced. Moreover, web accessibility is compatible with new

and emerging technologies. Those institutions that plan to offer services and information to netbooks, mobile phones and other handheld devices will benefit if their content is already accessible and if they have systems in place to sustain accessibility (Henry, nd).

Web Accessibility Requires Leadership

An institution-wide commitment to web accessibility can provide value beyond the obvious benefits to students and employees with disabilities. An official policy of web accessibility shows an institution's commitment to its constituents and to the quality of the materials it produces. It is aligned with an institution's mission and can affect the economics of an organization and promote or limit collaborations with peer institutions. Yet with all of these benefits, web accessibility in postsecondary institutions remains poor (NCDAE, 2008).

While many acknowledge that web accessibility is a problem, most institutions grapple with ideas of how to achieve and maintain it. Many faculty are unaware of, or do not understand, the legal requirements for supporting students with disabilities and many school and association officials have expressed the need for information on best practices and successful applications that can be easily adapted and disseminated across schools (US GAO, 2009). A 2006 assessment of web accessibility in Oregon Community Colleges found that those with a knowledge of disability issues (i.e., disability services) and information technology (IT) services were not integrated, making it difficult to develop a comprehensive accessibility plan (Wisdom et al., 2006).

Furthermore, the decentralized nature of most postsecondary institutions can

marginalize the work done by individual champions or even departments that ensure that their web content is accessible by the presence of inaccessible content beyond their control. The interconnected nature of the web requires that an individual navigates around a site, not a page; the most accessible webpage in the world is still inaccessible if a user with disabilities must navigate inaccessible pages to get to it (Rowland, 2007). Successful implementation of web accessibility requires system-level action (Bohman, 2004; WebAIM, 2004).

In other words, web accessibility efforts are most successful when the entire system is accessible. In order to achieve institution-wide web accessibility, administrative leadership is essential. However, full system change can be daunting, and administrators wishing to enact a policy of web accessibility or improve web accessibility on their campus benefit from resources and information tailored to their needs.

Benchmarking and System Change

One method being used in education for guiding change is benchmarking (Alstete, 1995). Benchmarking provides a process in which best practice is identified and used as a tool for learning and continuous quality improvement (Oakland & Tanner, n.d.). Marshall, Mitchell, and Beames (2007) noted that, in addition to driving change, benchmarking can: identify and establish standards of excellence, create a structure for keeping abreast of best practices, create a mechanism for measuring an institution's performance against world class institutions, provide a framework for establishing performance goals and quality improvement projects, and serve as a method for

motivating staff and encouraging innovation (Marshall et al., 2007).

Therefore, the use of benchmarking or best practice materials may serve as a viable option for institutions wishing to create and maintaining an accessible web presence.

Project GOALS

Project GOALS, funded through a grant from the US Department of Education—Fund for the Improvement of Postsecondary Education (FIPSE), set out to develop a set of web accessibility materials and processes specifically tailored for postsecondary institutions. These materials include: an Action Paper to raise the awareness of the need for web accessibility (<http://www.ncdae.org/goals/actionpaper.php>); a set of institutional “indicators” that outlines recommended practices for web accessibility in education (<http://www.ncdae.org/goals/indicators.php>); and a Web accessibility benchmarking and planning tool to assist institutions with self-study and continuous improvement of an institution’s web accessibility (<http://www.ncdae.org/goals/planningtool.php>). These materials were designed to help institutions use existing processes to institute, improve and maintain web accessibility across the institution. The cornerstone of these materials was the Institutional Indicators of accessibility. Based on the concepts of benchmarking and best practice modeling, these indicators would set the stage for the project’s *pièces de résistance*; the Benchmarking and Planning Tool. Therefore, it was essential that these indicators were accurate, understandable and usable for a wide range of audiences including: administrators who are key to instituting web accessibility policies, faculty and

staff who would be developing materials for the institutional web, and technology specialists who would be expected to implement web accessibility across the institution's web presence.

Recommended Practices for Institutional Web Accessibility

This document identified four key institutional indicators believed to be necessary for institution-wide web accessibility. They are (a) institutional vision and leadership commitment; (b) planning and implementation; (c) resources and support; and (d) assessment. These indicators are comprised of a series of benchmarks, which are expressed through actions that define, and show evidence of, that specific benchmark. The strength of institutional evidence for each benchmark can be evaluated by looking at various permanent products and documented processes. A full set of these indicators can be viewed at <http://www.ncdae.org/goals/indicators.php>.

The indicators were developed using a series of formative evaluations. Once an early draft had been developed, they were reviewed and revised by the full GOALS staff. Next they were evaluated by representatives from GOALS' partners: Kentucky's Council on Postsecondary Education (CPE), The Southern Region Education Board (SREB); WebAIM, and WICHE. A third round took advantage of the services of expert consultants. A fourth round queried the experiences of volunteers recruited using project and partner newsletters. Finally, in the summer and fall of 2009, a survey was conducted as part of a doctoral study that focused on the appropriateness of the indicators as a way to achieve institution-wide accessibility.

Methodology

The study used the precepts of social validation which has been used in behavioral research since its introduction by Montrose Wolf in 1978 (Schwartz & Baer, 1991). It is a method of assessing and analyzing consumer behavior (Gresham & Lopez, 1996) and can evaluate the acceptability and/or viability of a program (Schwartz & Baer, 1991).

The study sought to determine the extent to which the institutional indicators of web accessibility developed by Project GOALS were socially appropriate for three different target groups—administrators; faculty and staff; and technology specialists. To determine the appropriateness of the indicator document, the research questions posited were:

1. To what extent are the indicators *appropriate* for the purpose of providing a framework for web accessibility?
2. To what extent are the indicators *understandable* for the different target groups?
3. To what extent are the indicators *useful* for the different target groups?
4. What is the overall consumer *satisfaction* with the indicators for the different target groups?
5. To what extent are the indicators comprehensive enough to allow for differences across the different target groups?

Due to issues of length, this paper focuses on the first question; the extent to which the indicators are appropriate for the purpose of providing a framework for web accessibility for the different target groups. Additional aspects of the study are covered in other manuscripts.

Participants

The Indicators developed by Project GOALS are intended for use in postsecondary education to help assess, improve and maintain web accessibility. Implementation of institution-wide web accessibility will involve cooperation and commitment from, among others; administrators, faculty and technology staff. The target population for this study was therefore divided into these three categories.

Participants were recruited through Project GOALS' partners (CPE, SREB, WebAIM, and WICHE). Each of these influential associations had large communities within education from which to draw. Each Project GOALS partner was asked to invite 10 representatives from each of the three target groups to participate in the study for a total of 30 recruits per partner. They were asked to invite participants based on the following guidelines:

- Administrators who have participated in the accreditation or self-study process;
- Faculty who utilize the Web for courses (distance education, placing course materials such as the syllabus, handouts or tests online); and
- Technologists who are responsible for, or are deeply involved with, web development in a postsecondary educational setting.

The invitations were sent via email with information regarding the study and a link to a splash page where they could read the instructions along with the human subjects letter of information (see Appendix 5 – IRB Letter of Information) and then start the survey. Partners continued to invite participants until the goal of 30 completed surveys per target group was met.

Ninety-seven participants completed the surveys exceeding the target for 30 in each group. Tables 3.1 and 3.2 display characteristics of the participant sample by showing where participants worked and the average number of years participants held their respective job titles.

Instrument

This study utilized a questionnaire developed to assess the social validity of the indicators for the different target populations (see Appendix 1). The purpose of social validation is to obtain a subjective evaluation of a product or intervention (Wolf, 1978).

Table 3.1

Participant Counts by Job and Institution Types

Job type	Institution type			Totals
	2-year	4-year	Other ^a	
Administrators	7	24	0	31
Faculty	3	29	1	33
Technology specialists	4	26	3	33
Totals	14	79	4	97

^aInstitution type—Other = Board of Regents, Board Office and Medical School.

Table 3.2

Participants' Mean Number of Years in the Job by Job Type

Job type	Number of years in job
Administrators	12.00 s = 7.12
Faculty	12.67 s = 8.58
Technology specialists	9.00 s = 5.45
Totals	11.21 s = 7.27

The questions were divided into 4 sections: (a) demographics to get an understanding of who was responding to the survey; (b) questions pertaining to their attitude and knowledge of web accessibility which would be helpful as the data is interpreted; (c) questions on the appropriateness of each of the four indicators as a main focus for this investigation; and (d) questions seeking overall impressions of the comprehensiveness of the indicators. The questionnaire used a 7-point Likert-type scale (1 indicating the lowest score and 7 indicating the highest) and discrete (yes/no) questions to measure the subjective opinions of the participants (Fawcett, 1991; Francisco & Butterfoss, 2007; Kazdin, 1977; Schwartz & Baer, 1991). Open-ended questions probed the rationale behind their responses and provided a mechanism for participants to give additional feedback. The questionnaire was administered online using LimeSurvey (www.limesurvey.org/), an open source survey engine. The researchers worked with a local web-designer to ensure that the survey was fully accessible to any participants who may have disabilities. The participants' responses were automatically ported to a database and downloaded in SPSS for analysis.

Analysis

Descriptive statistics (i.e., mean, median, mode, and standard deviation) were run on each question and were used to describe the general attitude of the participants (and different demographic groups) toward individual indicators and the document as a whole. Additionally, inferential analyses including Kruskal-Wallis, Mann Whitney U, and chi square were utilized in order to uncover differences between demographic data and participant responses. Finally, Cronbach's alpha was used to check the robustness of the

responses to determine if composite scores could be generated by combining questions by dimension (appropriateness, usefulness, and satisfaction) and across indicators (1-4). All results were well above the .7 reliability threshold required for internal consistency using Cronbach's and additional analyses were performed using this composite data.

Comprehensive analyses of all the data collected were performed in the course of the study. However, this article will focus on the question of appropriateness of the indicators for the target groups.

Main Research Question

To assess the research question "To what extent are the indicators appropriate for the purpose of providing a framework for web accessibility?" the researcher used Likert-style questions to determine the participants' opinions of appropriateness of the indicators for use in both their own institution and other postsecondary institutions. Participant ratings were then analyzed by demographic values including job type.

Results

Web Planning and Self-Study Participation

Of the 97 respondents (see Tables 3.1 and 3.2), 59 respondents indicated that they had participated in some type of web planning work group. Of those web planning groups, 83.1% ($n = 49$) addressed web accessibility for individuals with disabilities. However, of the 66 respondents who had been involved in an institutional self-study, only 27% ($n = 18$) indicated that it had included a component for web accessibility.

Familiarity and Attitudes

Participants were asked to rate familiarity with web accessibility on a scale of 1 (low) to 7 (high). The mean for ratings of familiarity with web accessibility was 4.91. Technology specialists had the highest mean (5.48) followed by administrators (4.68) with faculty (4.55) rating familiarity with web accessibility as the least of all the groups.

The participants were also asked to rate the importance of web accessibility to themselves and to their institutions on the same 1-7 scale. Participants' consistently rated web accessibility as more important to themselves than to their institution. Figure 3.1 illustrates the means of the importance of web accessibility ratings by job type.

Appropriateness for Providing a Framework for Institution-Wide Web Accessibility

In order to provide a measure of the social validity of the indicators, respondents evaluated the appropriateness of each indicator for providing a framework for institution-wide web accessibility. For each of the four indicators, participants were asked to rate the appropriateness of the indicators for both their own and another institution on a scale of 1(low) to 7 (high). Figures 3.2, 3.3, 3.4, and 3.5 show the results for each indicator

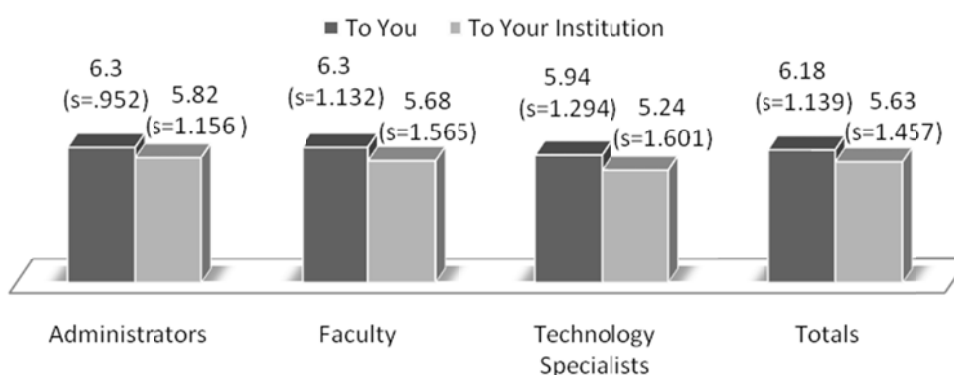


Figure 3.1. The importance of web accessibility to the participants' and to their institutions by job type.

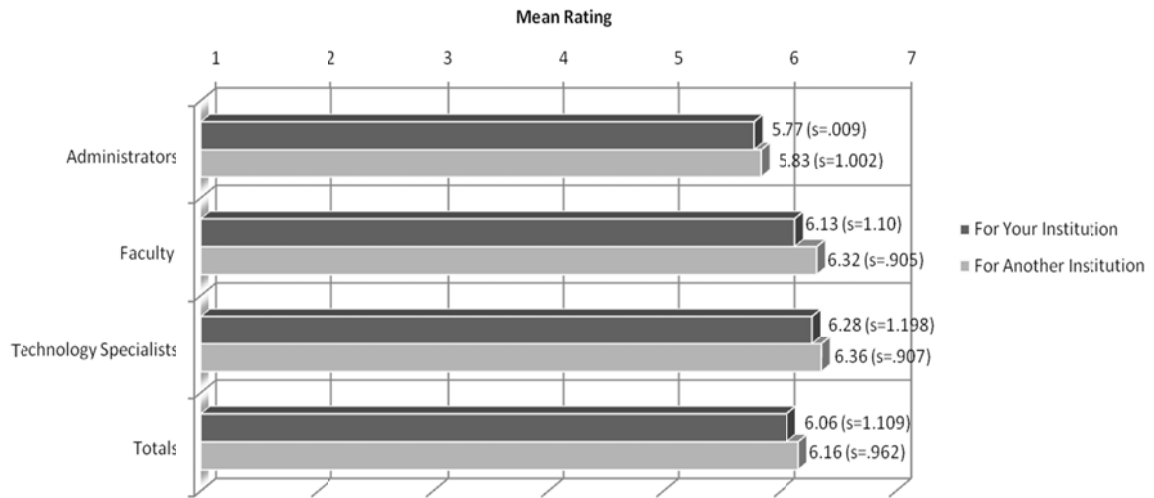


Figure 3.2. Means for participant ratings of appropriateness of indicator 1 (vision and leadership) for participants' institution (own) and another institution (other) by job type.

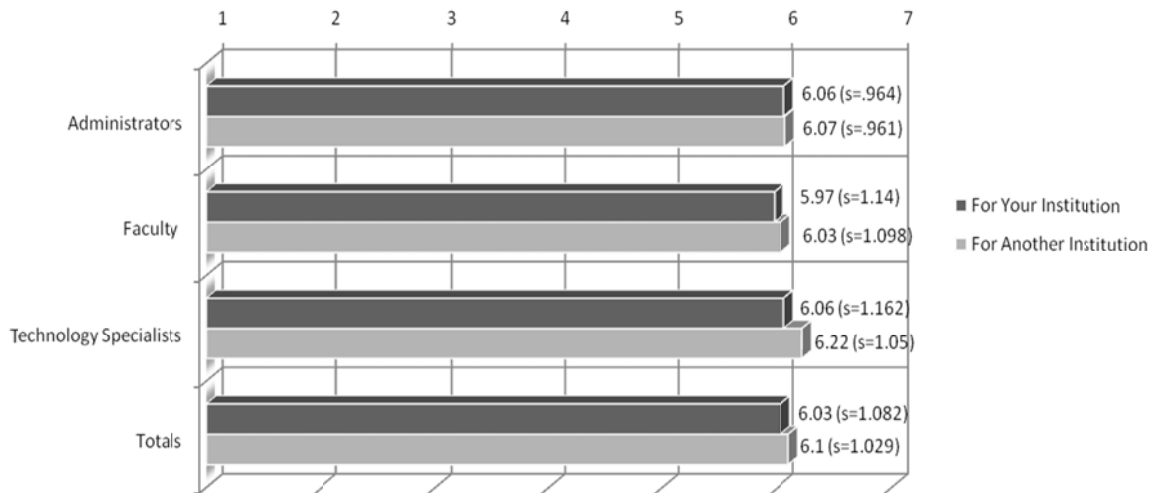


Figure 3.3. Means for participant ratings of appropriateness of indicator 2 (planning and implementation) for participants' institution (own) and another institution (other) by job type.

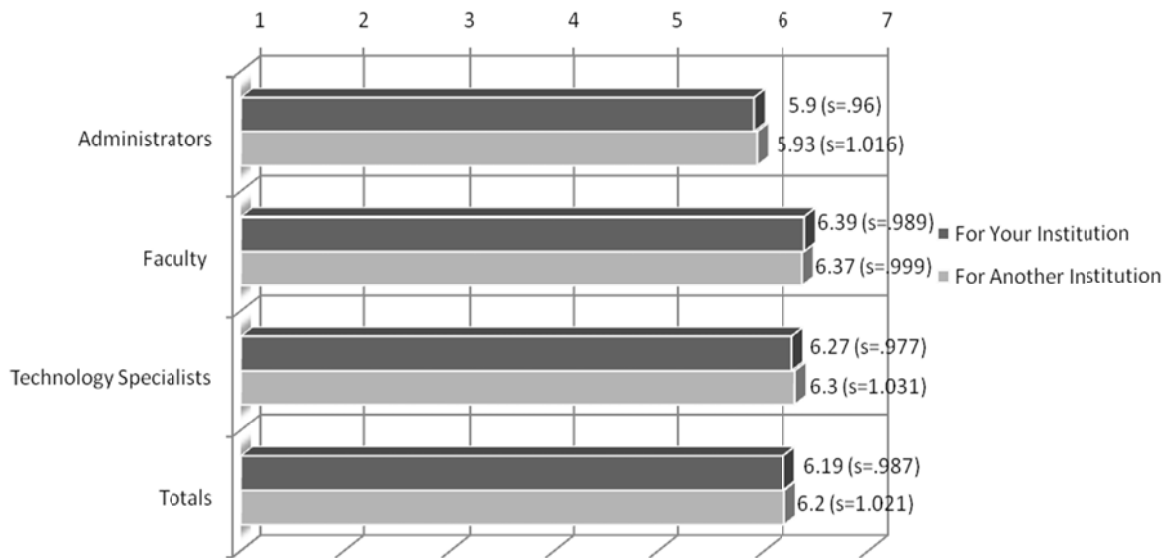


Figure 3.4. Means for participant ratings of appropriateness of indicator 3 (resources and support) for participants' institution (own) and another institution (other) by job type.

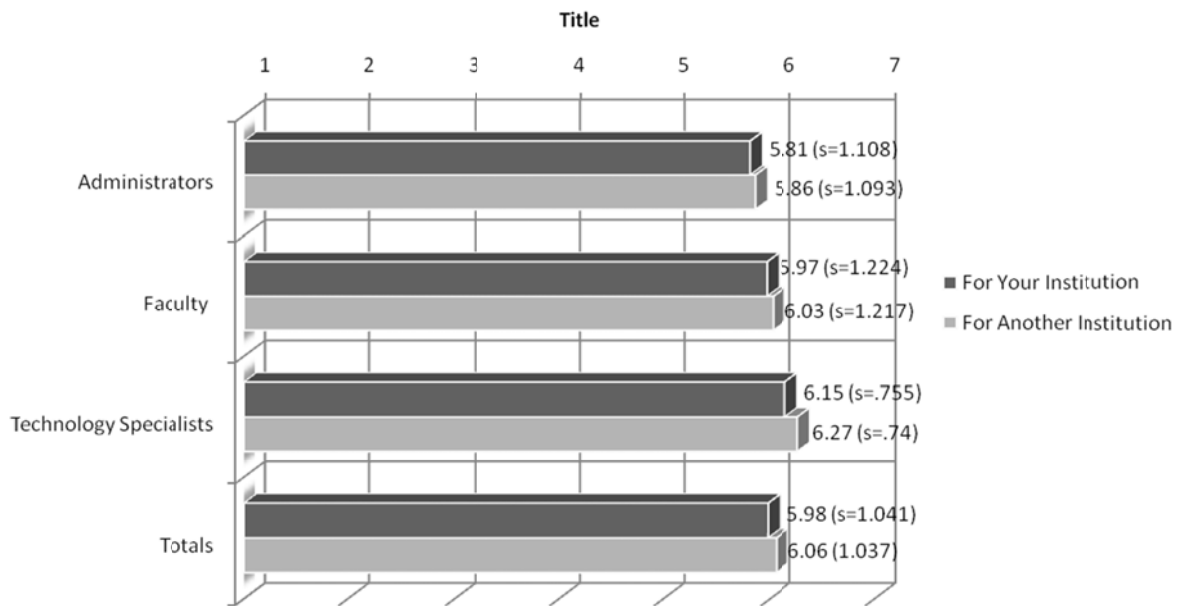


Figure 3.5. Means for participant ratings of appropriateness of indicator 4 (assessment) for participants' institution (own) and another institution (other) by job type.

displayed by job type.

The means of participant ratings across all four indicators ranged from a low of 5.77 (Indicator 1—institutional vision and leadership commitment [administrators]) to a high of 6.39 (Indicator 3—resources and support [faculty]). These results demonstrate strong levels of support for the indicators as a framework for institutional web accessibility. When the ratings were compared by job type (administrator, faculty, tech specialist), a trend emerged across three of the four indicators (Indicator 2—planning and implementation notwithstanding); the administrators group rated the indicators lower than the other groups. In the case of Indicator 1—institutional vision and leadership commitment [for your institution], the difference in rating means was statistically significant ($p = .032$). Meaning that the chance was less than 5% that the differences found between the groups' rating means were Type 1 errors (false positives). It should be noted, however, that while the means for the administrator groups' ratings were lower than the faculty or technology specialist groups, these means still ranged from a low of 5.77 (Indicator 1—institutional vision and leadership commitment) to a high of 6.06 (Indicator 2—planning and implementation), which would suggest that the administrator group still found the indicators appropriate for the purpose of providing a framework for web accessibility.

Interestingly, all three groups rated the indicators as more appropriate for other institutions than their own. The only exception was Indicator 3—resources and support, which faculty rated slightly higher for their own institution (\bar{x} 6.39 to 6.37).

In general, all four indicators appear to be appropriate for the purpose of

providing a framework for web accessibility. However, Indicator 2—planning and implementation showed the most variation in opinion across the participant groups.

Participants' Likelihood for Recommendation and Use

When asked if participants would use the Indicator document, 96 % of them ($n = 93$) said that they would and 98% ($n = 95$) said that they would recommend it to others to use at their institutions. This response is strong social validation for the set of recommended practice indicators for institutional web accessibility.

Discussion

The rating means for the appropriateness of the indicator document as a framework for institution-wide web accessibility were relatively high. However, there was a trend indicating that these materials may resonate better with those on the front lines of the struggle for web accessibility. Traditionally, personnel in administrative positions have been a step removed from the problem, relying on disability services to take care of things (Kuusisto, 2009).

It is also possible that the trend toward lower ratings from the administrator group could be a result of the emphasis on administrative input and support—in both resources and time—within the indicator document itself. Given the current economic situation and the heavy load most administrators already have on their plate, adding yet another concern may be the last thing they would want to do. However, shrinking resources, evolving technologies and a rising wave of advocacy are bringing the issue to the

forefront. Web accessibility is no longer ‘somebody else’s problem’ or an issue that can wait until later. In fact, the 2009 Campus Computing Project found that ADA Compliance was among CIO’s top issues confronting online education over the next 2-3 years (Green, 2009).

Another explanation may be that administrators may be older and, in general, less comfortable with technology than the faculty and technology specialists. They are also not as likely to use technology to develop courses and educational materials as part of their everyday responsibilities. This lack of familiarity may impact their attitudes toward technology that would, in turn, compound any discomfort with an issue as substantial and potentially complex as web accessibility.

Administrators may also be less susceptible to the social desirability phenomenon, a common phenomenon where participants have a tendency to over-report socially acceptable or desirable attitudes and behaviors (Sierles, 2003). Given their experience and the number of surveys a typical administrator is asked to complete, it is possible that they are less likely to be influenced by peer or social pressures such as this. However, regardless of the reason, the lower rating means for administrators may indicate that more work is needed to recruit and engage administrators on this critical issue of access for all.

One trend of interest is the gap between participants’ ratings on the appropriateness of the indicators for their own institutions and the appropriateness of the indicators for other institutions. Each indicator and set of benchmarks were consistently rated as higher (i.e., more appropriate) for another institution. It is possible that, as this was a voluntary survey, the participants who responded are making a difference at their

institutions and that they feel that they are doing better than other institutions who may need added help or instruction on web accessibility. However, another explanation may echo that of the technology adoption lifecycle (Norman, 1999). While innovators and early adopters have embraced the idea of web accessibility, the concept has yet to cross the chasm to the pragmatists and majority of the population who are waiting until the path has been forged and a convenient and easy solution has been developed. Thus, the participants may signal that they would hold off slightly on using the indicators until they see how they fare at other institutions. A study to evaluate the adoption cycle of web accessibility may produce some interesting and valuable insights on how to push past the chasm and engage the majority in postsecondary web accessibility.

While this article focuses mainly on the question of appropriateness of the Indicator document as a framework for institution-wide web accessibility, it also touches upon some other trends that are worth noting. The first of these involves the participants' opinion of web accessibility and their perception of the importance of web accessibility to their institution. When asked to rate the importance of web accessibility to themselves and to their institution, the rating means for importance were consistently higher for the participants than their institutions. This result is noteworthy as it may explain why web accessibility in postsecondary education leaves much to be desired despite a decade of advocacy; the perception of lesser importance makes it unlikely that people will spend valuable time and resources on issues that are not valued by their employers. This response highlights the importance of administration's role in ensuring that accessibility is promoted and endorsed as a critical part of the institutional web.

Another trend of interest is the participants' ratings of familiarity with web accessibility when compared by job type (administrator, faculty and technology specialist). Not surprisingly, the average ratings by technology specialists were somewhat higher than faculty or administrators. However, the technology specialists' mean rating of 5.48 (out of 7) for familiarity with web accessibility may be cause for concern as they are the group that should have the technological knowledge necessary to implement web accessibility. This result would suggest that education and training about web accessibility needs to include all job types, including technology specialists.

Studies in other fields have shown a positive link between attitude and familiarity with a concept. This phenomenon is recognized in areas as diverse as computer use and aversion (Schulenberg & Melton, 2008), cancer and genetic testing (Sussner, Thompson, Valdimarsdottir, Redd, & Jandorf, 2009) and brand recognition and advertising (Phelps & Thorson, 1991; Rhee, 2009). Future studies should further investigate the role that familiarity and attitudes regarding web accessibility play in postsecondary education and the institutional web.

Conclusion

The web is vital in today's postsecondary education, but accessibility for all has proven to be a persistent problem. Institutions across the nation are at a crossroads in their response to this important issue. Administrative leadership is crucial if institution-wide web accessibility is to succeed. With strong leadership and a centralized effort, a vulnerability can be transformed into an institutional strength.

The results of this study indicate that the Institutional Indicators of Web Accessibility developed by Project GOALS are appropriate for the purpose of providing a framework for institution-wide web accessibility. It is the hope of the authors that they will be used by administrators, faculty and web technology specialists alike to improve institutional web accessibility across the postsecondary spectrum.

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CHAPTER 4

THE DEVELOPMENT AND EVALUATION OF A SET OF INSTITUTIONAL
INDICATORS OF WEB ACCESSIBILITY TO ASSIST POSTSECONDARY
INSTITUTIONS IN ENSURING THEIR WEB PRESENCE
IS ACCESSIBLE TO ALL²

Abstract

For persons with disabilities, the web is a double-edged sword. While an accessibly designed website can mitigate or remove barriers, an inaccessible one can make access intolerable if not impossible. Furthermore, the web is essential for effective modern education—being used for everything from course catalogs and registration to teaching and testing. If websites that provide necessary information are not accessible, students with disabilities will be unable to independently complete, or compete in, these courses. To achieve institution-wide web accessibility, systemic change is needed. Establishments of higher education need to promote institution-wide change to address and maintain web accessibility in postsecondary institutions. It follows then, that change must be supported (and often mandated) from the top. Project GOALS has developed a document outlining a set of four Institutional Indicators of Web Accessibility. Institutions of education can use this document in their efforts to ensure that online content is accessible to all users. This paper describes development and evaluation of the indicator document.

² This paper is coauthored by Cyndi Rowland and Roxanne Pfister and will be submitted to the *Journal of Special Education Technology*.

The document was evaluated using social validation methods to determine if the document was appropriate for providing a framework for web accessibility across a variety of demographic markers including job type (administrator, faculty and technology specialist) and institution type (2- and 4-year).

Ninety-seven participants reviewed the document and completed an online survey rating the document. Using a series of Likert-style questions on a 7 point scale (1 indicating the lowest rating and 7 indicating the highest), the participants rated each of the four indicators for appropriateness, understandability, usefulness, and overall satisfaction.

Two trends emerged in data analysis: (a) administrators tended to rate the document somewhat lower than faculty or technology specialists, and (b) participants from 2-year schools consistently rated the document higher than their 4-year counterparts. However, the median ratings for all questions of appropriateness, understandability, usefulness, and satisfaction were a 6 or 7 across the board. These results would indicate that while different aspects may appeal to different groups, participant ratings across job and institution type show acceptable levels that validate the use of the indicators as a tool to assist institutions in their web accessibility efforts.

Introduction

Web accessibility is crucial in modern postsecondary education. The number of college students taking online courses is expected to rise from the current 12 million to over 22 million by 2014 (Nagel, 2009). Much of the information in postsecondary

institutions is now disseminated using the Internet as opposed to traditional print-based methods. Furthermore, schools are using the Web for everything from course catalogs and registration to teaching and testing (Waddell, 2007; WebAIM, 2004). If websites that now provide necessary information are not accessible, students with disabilities will be unable to independently complete, or compete in, these courses (Rowland, 2000; Rowland, Burgsthaler, Smith, & Coombs, 2004; Rowland, Mariger, Whiting, & Christensen, 2008; Schmetzke, 2001).

This issue takes on greater importance when you consider that most Americans will experience some form of disability in their lifetime (CDC, 2007). This disability could be temporary, such as a broken leg, or last a much longer term. However, advances in technology have the potential to help level the playing field for many persons with disabilities. Assistive technologies and the Internet offer access to information and independence that was once out of reach. However, for the 8.5% of the population that has at least one disability that impacts computer and Internet use (Waldrop & Stern, 2003), the web is a double edged sword. While an accessibly designed website can mitigate or remove barriers, an inaccessible one can make access intolerable, if not impossible. For example, websites are generally designed for people who use a mouse for navigation. However, people who are visually impaired may use screen magnifiers or screen readers and often navigate using their keyboards making sites that require a user to “point and click” to get around almost impossible to use (WebAIM, 2003).

The idea of UDL (universal design for learning)—designing educational environments (including websites) that are usable and useful for a wide variety of

learners—has gained a foothold in K-12 education. However, those in higher education have been much slower to adopt the concept (Harper & DeWaters, 2008). UDL combines the pedagogical aspects of learning—presentation, expression and engagement, with the idea of universal design originated by the architectural movement in the physical world, and the product development aspects of electronic accessibility (Center for Applied Special Technology [CAST], 2007). However, the latter aspect—electronic accessibility is a relative newcomer to the universal design table. Pedagogical concepts such as Kolb's Learning Styles and Gardner's Multiple Intelligence theories have been seminal to the educational world since the 1980's (Gardner; 1983; Kolb, 1984) and for the past 20 years, the American with Disabilities Act (ADA) has been successful in improving physical access, but universal design is just starting to impact the virtual world as well (Gerencher, 2010).

This impact is likely to grow with the recognition of the importance of the Internet to modern life. In April of 2010, Assistant Attorney General for Civil Rights, Samuel Bagenstos testified before the House Judiciary Subcommittee acknowledging the gap that exists between current legislation and technology and emphasizing that intent of the ADA regulations was to ensure equal access to all important aspects of American civic and economic life (Bagenstos, 2010). This declaration was confirmed by the Department of Justice who has issued an "Advance Notice of Proposed Rulemaking on the Accessibility of Web Information and Services Provided by Entities Covered by the ADA." The department is considering options, reviewing resources and reviewing over 11,000 public comments (Regulations.gov, 2011) regarding an updating of the

regulations for Titles II and III of the ADA to include web accessibility for persons with disabilities (US DOJ, 2010).

While an acknowledgement of the need for accessible websites is growing and there are a number of laws and regulations significant for the rights of students, faculty and staff with disabilities (e.g., the ADA and Sections 504 and 508 of the Rehabilitation Act), online accessibility at the postsecondary level leaves a great deal to be desired. In fact, accessibility in postsecondary environments has changed little over the past decade. Studies of university and college websites conducted in 1999 and 2008 found accessibility issues in 97% of a national sample of webpages just one step off of the institutional home page (NCDAE, 2008; Rowland & Smith, 1999).

Many postsecondary institutions still rely on the accommodation model as an answer to the mandates set by the ADA and Section 504 of the Rehabilitation Act. However, after the fact accommodations are more inefficient to produce and maintain and individual accommodations are expensive. For example, one university's disability service office reported that while they served 1,500 students, almost 30% of their budget was spent on sign language interpreters for six students (US GAO, 2009). While these expenses are necessary and appropriate, it means that all other accommodations would have to come out of the remaining budget. With most institutions operating on already stretched funds, spending time and resources on accommodations that could easily be incorporated in initial development (or through procuring accessible goods and services), is a waste of valuable resources. Even worse, if necessary web resources are not accessible and accommodations are created only when they are requested, the user must

wait for the materials to be produced and often the results do not provide an equivalent experience for the user (WebAIM, 2004). Persons with disabilities are more aware than ever of their rights and they are willing to advocate for themselves. This activism can lead to bad publicity, litigation and additional expenses for the institution (Mariger, Rowland, Whiting, Christensen, & Rigley, 2010). Kuusisto (2009) noted that the “rehab” model of disability where administrators can hand off responsibility for accessibility to disability services is outdated, students with disabilities are no longer willing to wait for access or to be treated as second-class citizens.

While many acknowledge that web accessibility is a problem, most institutions grapple with ideas on how to achieve and maintain it. Authors from a 2006 assessment of web accessibility in Oregon community colleges found that those with knowledge of disability issues (i.e., disability services) and those in IT were separate entities—each working in isolation from the other. This disconnect, made it difficult to develop a comprehensive accessibility plan. They also found that although faculty members are supportive of web accessibility, they have limited resources and trouble discerning what is a reasonable or unreasonable burden (Wisdom et al., 2006). Furthermore, the decentralized nature of most postsecondary institutions can negate the work done by individual champions or even departments that ensure that their webpages are accessible. The most accessible webpage in the world is still inaccessible if a user with disabilities must navigate inaccessible pages to get to it (Rowland, 2007). The fact is, web accessibility at a postsecondary institution is more likely to be effective if it is implemented as an institution-wide initiative.

To achieve institution-wide web accessibility, systemic change is needed.

Establishments of Higher education need to promote institution-wide change to address and maintain web accessibility in postsecondary institutions (WebAIM, 2004). Meaning, that change must be supported (and often mandated) from the top. However, this level of support can be a challenge in the climate of today's higher education. Given the limited resources and growing demands on postsecondary institutions, what can be done to encourage administrators to commit the necessary resources and leadership to ensure accessibility? While, many school and association officials have expressed the need for information on best practices and successful applications that can be easily adapted and disseminated across schools (US GAO, 2009), almost a decade of technological advance has not provided the impetus for improved accessibility on its own merits (NCDAE, 2008).

Such were the challenges faced by Project GOALS. Project GOALS (www.ncdae.org/goals/) is a national consortium led by the NCDAE with money from the FIPSE. It's aims are to develop, evaluate, and disseminate materials and processes in web accessibility that institutions of postsecondary education can use in their efforts to ensure that online content is accessible to all users. To this end, Project GOALS has developed a set of materials including:

1. An **Action Paper** targeted to high-level postsecondary administrators (e.g., CIO's, CAO's). It is designed to raise their awareness for web accessibility, emphasizing the need for leadership to make it happen (<http://www.ncdae.org/goals/actionpaper.php>).
2. A document of **Institutional "Indicators"** that outlines recommended practices to achieve institution-wide web accessibility in postsecondary education (<http://www.ncdae.org/goals/indicators.php>).

3. A web-based **Web Accessibility Benchmarking and Planning Tool** to assist institutions in assessing, planning, tracking and improving institutional infrastructure to support web accessibility (<http://www.ncdae.org/goals/planningtool.php>) (Project GOALS, 2009).

It is hoped that these materials can help administrators, faculty, and technology staff to understand, plan for, and maintain web accessibility across the institution's web presence. The Institutional Indicators of accessibility would serve as the structure for the culminating product—The GOALS Benchmarking and Planning Tool. Therefore, it was essential that the indicators were appropriate, understandable, usable and afforded satisfaction for all stakeholders so an institution could achieve and sustain an accessible web presence. Some stakeholder groups include; administrators, faculty and staff, and technology specialists. To that end, and as part of a doctoral thesis, a research study to evaluate the social appropriateness of the Institutional Indicators as a method of achieving institution-wide web accessibility took place during the summer and fall of 2009. This paper will discuss the development of the indicators, provide an overview of the document, discuss the methodology of the study and report some of its findings and implications.

GOALS Institutional Indicators for Web Accessibility

At the onset of the grant, the GOALS team was faced with a daunting challenge: create a process to assist institutions as they work to achieve web accessibility. Furthermore, the process needed to be detailed enough to serve as a useful blueprint for web accessibility but open-ended enough to be adaptable to the unique situations of an array of institutions. For inspiration, the team looked to other models of system reform

such as self-study and benchmarking.

Self-study is used by institutions during the accreditation process and at other times to help an institution assess progress, show accountability, and promote and maintain quality within the organization (CHEA, 2007; Glidden, 2006; WASC, 2010). In addition to verifying an ongoing commitment to quality, the self-study process can be used as a catalyst for strategic change within an organization and can bring together diverse (and often opposed) university subcultures to work towards common and agreed upon outcomes (Lillis, 2007; Morrill, 2007, pp. 226-227). Through a shared commitment, administration could engage faculty members in administrative activities that were crucial to the institution, could not be achieved without their support and were not traditionally considered within their preview (Martin, Manning, & Ramaley, 2001).

Benchmarking provides a process in which best practice is identified and used as a tool for learning and continuous quality improvement (Oakland & Tanner, n.d.). Successful benchmarking requires an investment in time and resources, especially from senior management (Marshall et al., 2007). According to Bender (2002), “Institutional evolution through planned change processes is an organizational imperative” (p. 113). In order to survive, institutions must continuously evaluate an organization’s structure and procedures. Benchmarking can be used to help transform institutional culture and overcome resistance to change.

These two models provided the groundwork for our emerging process along with examples provided by our project partners. The first was WebAIM’s (www.webaim.org) *8-Step Implementation Model of Reform* (WebAIM, 2004). The second was the WCET’s

(www.wcet.info) *Best Practices for Electronically Offered Degree and Certificate Programs* (WCET, n.d.); this document helped to provide a similar service to the burgeoning field of Web-based Distance Education in its early years. WCET's best practice document was so successful in fact, that it was adopted by the regional accrediting commissions and is now used as their standard guide for evaluation of online programs (WCET, n.d.).

GOALS partners identified four key conditions absolutely necessary to support institution-wide web accessibility. these conditions, or "*indicators*," are each comprised of several "*benchmarks*" or aspects of that indicator. The benchmarks are, in turn, expressed through a series of "*Evidence*"—actions and documentation that substantiates that specific benchmark. The strength of the benchmark is based on the evidence that supports it. These three tiers provided the framework for the Indicators document. Figure 4.1 outlines the first two levels of the indicator document. To view the full Indicator document, visit <http://www.ncdae.org/goals/indicators.php>.

The indicator document was created by Project GOALS specifically to provide a framework for institutions that wish to implement, improve or maintain an accessible institution-wide web. Social validation was used to help determine if the document was appropriate for this task. The purpose of social validation is to obtain a subjective evaluation of a product or intervention (Wolf, 1978). Acceptability of the product or intervention can be assessed using a number of facets: acceptability of the focus of the product or intervention, the acceptability of the procedures used by the product or intervention, and finally, the importance of the behavior change elicited by the product or

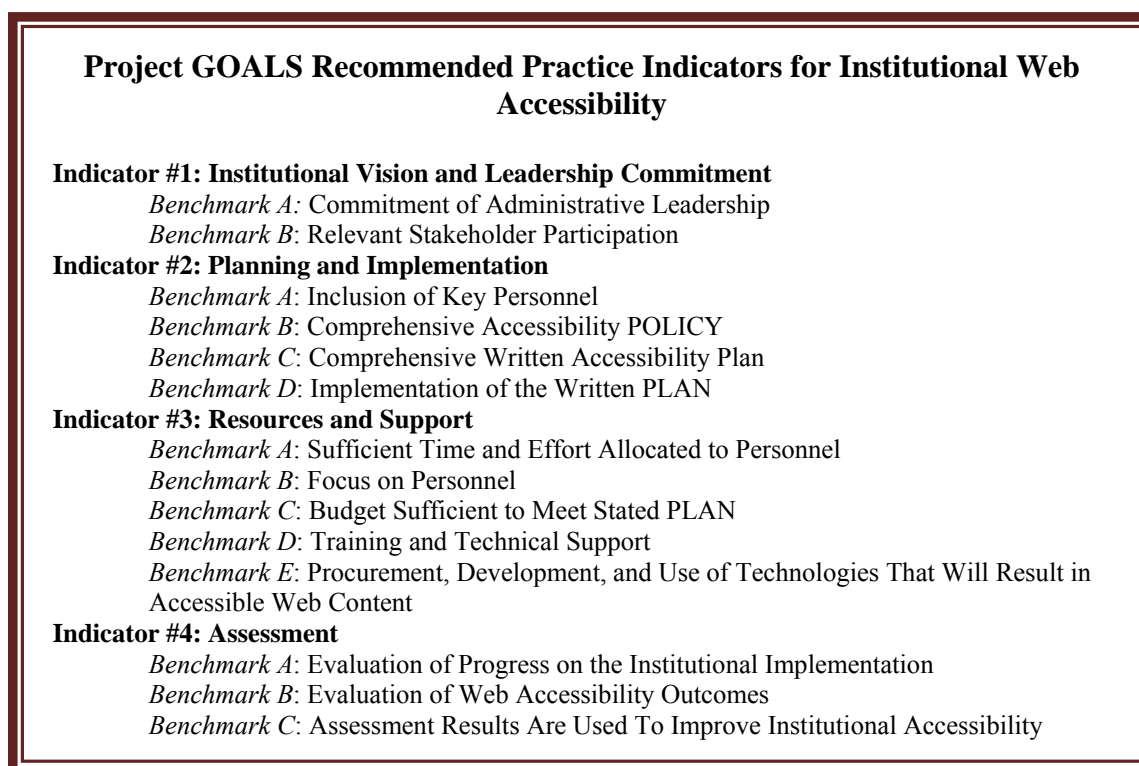


Figure 4.1. Indicators and benchmark levels of a set of institutional indicators for web accessibility developed by Project GOALS.

intervention. These assessments are done using the consumers of the product or intervention as evaluators. Consumer satisfaction is an important measure of social validity which can provide far-reaching value: by including potential consumers in the evaluation not only can you improve your product, you also provide a basis for its' marketing (Gresham & Lopez, 1996). "Researchers are educated by the consumers of their products regarding the good and bad features and the desirable and undesirable outcomes" (Finney, 1991).

Methodology

Successful implementation of institution-wide web accessibility requires a team

effort. In order to promote online accessibility in postsecondary institutions, collaboration between administrators, faculty, staff and technology specialists is critical as is building motivations that encourage system change. The GOALS indicators document stresses collaboration across all levels of postsecondary personnel and therefore must be appropriate for this expansive audience.

This study sought to determine the extent to which three different target groups—administrators; faculty and staff; and technology specialists evaluated the Institutional Indicators of web accessibility developed by Project GOALS to be socially appropriate. The research questions posited were:

1. To what extent are the indicators *appropriate* for the purpose of providing a framework for web accessibility?
2. To what extent are the indicators *understandable* for the different target groups?
3. To what extent are the indicators *useful* for the different target groups?
4. What is the overall consumer *satisfaction* with the indicators for the different target groups?
5. To what extent are the indicators comprehensive enough to allow for differences across the different target groups?

Participants

Participants were then recruited via emailed invitations from Project GOALS' partner liaisons that include: Kentucky's Council on Postsecondary Education (CPE); NCDAE; The Southern Region Education Board (SREB); WebAIM; and the WICHE. These highly influential associations have large communities within postsecondary education that helped to diversify the sample. For statistical analyses, a target of at least

30 participants from each of the three main groups (i.e., administration, faculty, and technology staff), totaling at least 90 participants, were sought to complete the survey.

Invitations issued by the GOALS partners resulted in a total of 97 completed surveys. This result exceeded the target of 30 surveys per target group. The majority of the respondents (79) were from 4-year institutions, 14 were from 2-year schools and three chose “other,” indicating that they were with the Board of Regents, a board office, and a medical school.

Instrument

An online survey was developed and transferred onto the LimeSurvey framework (<http://www.limesurvey.org/>), an open source survey engine. The online format was a convenient venue for participants and allowed responses to be automatically ported to a database eliminating the danger of transcription errors. A pilot survey was conducted first, and revisions made to the final instrument. Of particular concern was a discovery that the generated surveys were not fully accessible for persons with disabilities. A professional web designer was then recruited to work with the LimeSurvey open source development group to help make the changes to the survey engine that would ensure full accessibility.

The survey itself contained a section for demographics; four sections pertaining to the individual indicators (1-4); and an overall/summary section. The survey contained short and limited answer questions (i.e., 2-year, 4-year, or other to describe their institution type) to gather demographic information regarding the participants. Most questions were presented as either a 7-point Likert-type scale (1 = low to 7 = high) or

discrete (yes/no) questions to register the opinions of each participant. Open-ended questions were also used to probe rationale for some responses and provide a mechanism for participants to give additional feedback.

Analysis

In addition to the descriptive analysis (mean, median, mode, range and standard deviation) inferential statistics were used to look for differences between the data sets. Since Likert-type data is ordinal in nature, Achyar (2008) recommended the use of nonparametric measures for analysis. This choice was also desirable given the relatively small numbers within different data groups of interest (e.g., job description, number of years in position, and institution type). To explore differences across groups chi-square tests were used for yes/no questions, Kruskal-Wallis for Likert-type responses, and Mann Whitney U for limited answer questions. In addition, the reliability measure Cronbach's alpha was used to ensure that there was an acceptable level of internal consistency of the responses. These reliability tests showed that enough consistency ($r > .70$) did exist to allow aggregate ratings to be generated and analyzed across the different dimensions of interest (appropriateness, usefulness, and satisfaction) and across all four indicators. Matrices showing the results for all inferential analyses are available in Appendix 6.

For the purposes of evaluating the results, if at least 75% of participant ratings were either a 6 or 7 (on a 7-point scale), the results were determined to be "very good"; if they were a 5, the results were determined to be "good"; if they were a 4, the results were determined to be "average" and if they were a 3 or below, they were determined to be "poor."

Results

On average, participants had been in their position 11.21 years. This result would suggest that the participants are not novice academicians and were familiar enough with their roles to serve as adequate representatives. Tables 4.1 and 4.2 show the breakdown of time spent in their position by job and institution type.

Appropriate as a Framework

To investigate the research question, “To what extent are the indicators appropriate for the purpose of providing a framework for web accessibility?” Participants were asked to rate the appropriateness of the indicators for both their own and other institutions on a scale of 1 (low) to 7 (high).

Table 4.1

Mean Length of Time in Job by Job Type

Job type	Mean length of time
Administrators ($n = 31$)	12.00 $s = 7.12$ range = 26
Faculty ($n = 33$)	12.67 $s = 8.58$ range = 37
Technology specialists ($n = 33$)	9.00 $s = 5.45$ range = 22
Totals	11.21 $s = 7.27$ range = 38

Table 4.2

Mean Length of Time in Job by Institution Type

Time in job	Mean length of time
Two-year ($n = 14$)	9.5 $s = 9.8$ range = 38
Four-year ($n = 79$)	11.61 $s = 6.93$ range = 34
Totals	11.21 $s = 7.27$ range = 38

The rating means on questions of appropriateness for each of the indicators ranged from a high of 6.2 (Indicator 3 [Resources and Support]—other institutions) to a low of 5.98 (Indicator 4 [Assessment]—their own institution). These relatively high means are consistent with the notion that participants viewed the indicators as an appropriate framework for not only their own, but other institutions as well.

The results for appropriateness can be said to be “very good” as specified by the evaluation metric described in the analysis section. Over 75% of the ratings for all indicators (for both their own and other institutions) were 6s or above with a median rating of 6 for Indicator 1 (Institutional Vision and Leadership Commitment), Indicator 2 (Planning and Implementation) and Indicator 4 (Assessment). Indicator 3 (Resources and Support) received a median rating of 7. Furthermore, the minimum mean rating (excluding outliers—those ratings which were less than 1.5 times the lower quartile) was 5. Figure 4.2 displays a box plot showing the distribution of ratings (1-7) by indicator for both their own and other institutions.

When compared by job type (administrator, faculty, tech specialist), an apparent trend in these data warranted further testing: with the exception of Indicator 2 [Planning and Implementation], the rating means for administrators were lower than the rating means of the other two groups. Kruskal-Wallis analysis revealed that a statistically significant difference ($p < .05$) was present between the administrator group when compared to each of the other two groups’ rating means for Indicator 1 [Institutional Vision and Leadership Commitment]—their own institution. This value means that this result is an unlikely chance occurrence under the null hypothesis with randomization and

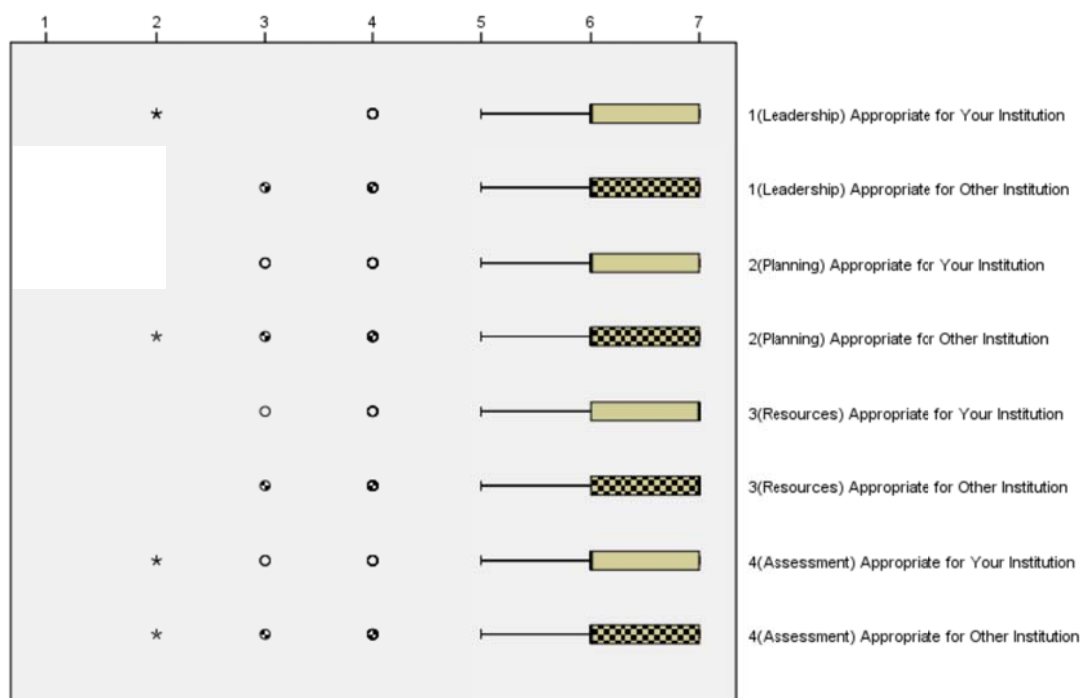


Figure 4.2. Box plot with medians and interquartile ranges show the appropriateness of the indicators as a framework for “your own” and “other” institutions based on a scale of 1 (low) to 7 (high), ($n = 97$).

an N of the same size. Table 4.3 shows the rating means with medians and modes for each target group per indicator.

When comparing the means for each rating cluster by the type of institution (2- or 4-year) across participant group membership, a trend emerged. Inferential analysis revealed that personnel at 2-year schools rated the indicators consistently higher than those at 4-year schools. Analyses revealed statistically significant differences for Indicator 1 [Institutional Vision and Leadership Commitment] and Indicator 2 [Planning and Implementation]. These differences were significant to $p < .01$ when participants responded to the appropriateness of the indicators for their own institution and to $p < .05$ when considering the appropriateness of the indicators for other institutions. Moreover, an aggregate of both dimensions (appropriate for their own institution + appropriate for

Table 4.3

Appropriateness of Indicators as a Framework—Means and Other Measures of Central Tendency by Job Type

Job type	How appropriate is this indicator as part of a framework for considering web accessibility at <u>your</u> institution?				How appropriate is this indicator as part of a framework for considering web accessibility at <u>another</u> institution?			
	Indicator #				Indicator #			
	1 Leadership	2 Planning	3 Resources	4 Assessment	1 Leadership	2 Planning	3 Resources	4 Assessment
Administrators (<i>n</i> = 31)	5.77 med=6 mode=5	6.06 med=6 mode=6 ^a	5.90 med=6 mode=7	5.81 med=6 mode=6 ^a	5.83 med=6 mode=5	6.07 med=6 mode=6	5.93 med=6 mode=7	5.86 med=6 mode=7
Faculty (<i>n</i> = 33)	6.13 med=6 mode=7	5.97 med=6 mode=6	6.39 med=7 mode=7	5.97 med=6 mode=6 ^a	6.32 med=6.5 mode=7	6.03 med=6 mode=6	6.37 med=7 mode=7	6.03 med=6 mode=6
Technology specialists (<i>n</i> = 33)	6.28 med=7 mode=7	6.06 med=6.5 mode=7	6.27 med=7 mode=7	6.15 med=6 mode=6	6.36 med=7 mode=7	6.22 med=7 mode=7	6.30 med=7 mode=7	6.27 med=6 mode=6
Totals	6.06 med=6 mode=7	6.03 med=6 mode=7	6.19 med=7 mode=7	5.98 med=6 mode=6	6.16 med=6 mode=7	6.10 med=6 mode=7	6.20 med=7 mode=7	6.06 med=6 mode=6 ^a

*multiple modes exist—smallest value is shown

other institutions] for each indicator was calculated and statistical significance ($p < .05$) was found for Indicator 1 (Institutional Vision and Leadership Commitment) and Indicator 2 (Planning and Implementation). Statistical significance ($p < .05$) was also found for an aggregate of the appropriateness of the indicators for their own institutions across all four indicators (Indicator 1 [Institutional Vision and Leadership Commitment] + Indicator 2 [Planning and Implementation] + Indicator 3 [Resources and Support] + Indicator 4 [Assessment]). Figure 4.3 illustrates the differences in rating means for appropriateness of the indicators as a framework for institution-wide web accessibility compared by institution type. This result indicates that participants from two-year schools found the indicators and overall document to be particularly appropriate providing a

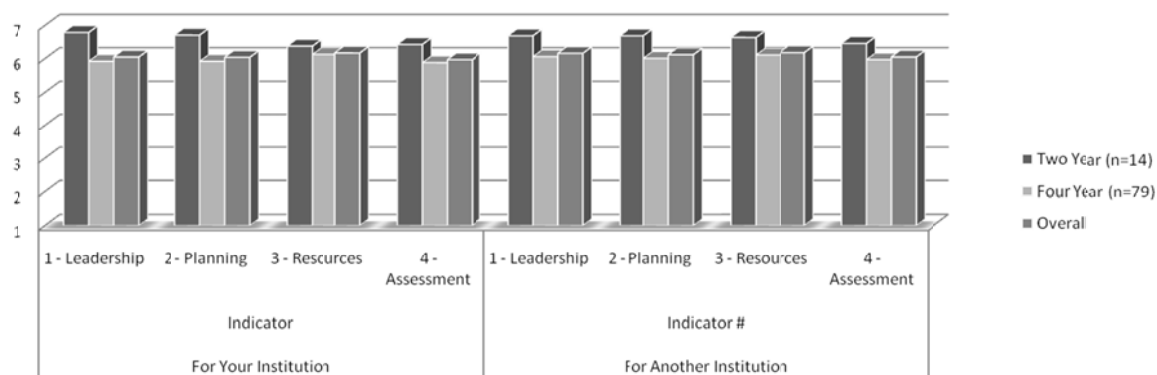


Figure 4.3. Appropriateness of indicators as a framework for web accessibility: Means for each rating by institution type.

framework for web accessibility.

An additional observation of interest when looking at the rating means (by job type, institution type and overall) is the fact that the participants consistently rated the indicators as more appropriate for providing a framework for web accessibility for other institutions than for their own.

All four indicators would appear to be appropriate for the purpose of providing a framework for web accessibility. However, Indicator 2 [Planning and Implementation] showed the most variation in opinion across all of the independent variables.

Understandability of the Indicators

To investigate the research question, “To what extent are the indicators understandable for the different target groups?” participants were asked to rate the understandability of each indicator a scale of 1 (low) to 7 (high).

The participant group rating means for understandability ranged between 5.71 for Indicator 2 (Planning and Implementation) and 5.91 for Indicator 3 (Resources and

Support). The results for understandability can be said to be “good” as specified by the evaluation metric described in the analysis section. Over 75% of the ratings for all indicators were a 5 or above with a median rating of 6 for all four indicators.

The minimum mean rating (excluding outliers—those ratings which were less than 1.5 times the lower quartile) was a 3 for Indicator 1 (Institutional Vision and Leadership Commitment) and a 2 for Indicator 2 (Planning and Implementation), Indicator 3 (Resources and Support) and Indicator 4 (Assessment). Figure 4.4 is a box plot showing the distribution of ratings (1-7) for each Indicator.

When analyzed by job type (administrator, faculty, tech specialist), the trends discussed in the previous section continued. The means for ratings in the administrator

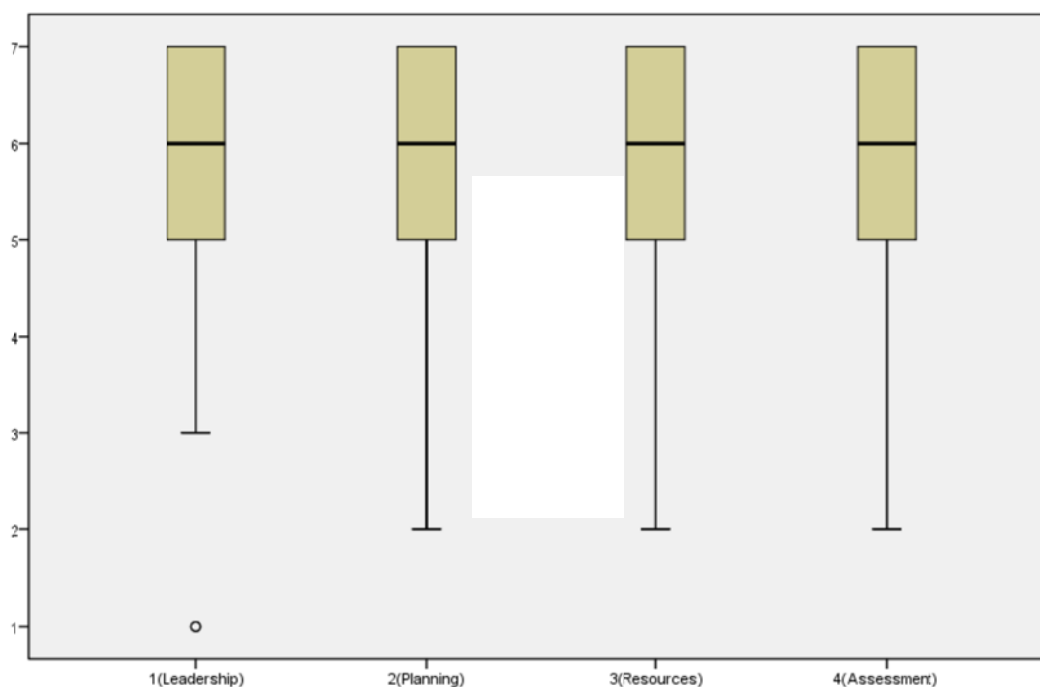


Figure 4.4. Box plot with medians and interquartile ranges show participant ratings of the understandability of the indicators based on a scale of 1 (low) to 7 (high), ($n = 97$).

group was consistently lower than the other groups. Kruskal-Wallis analysis revealed that a statistically significant difference ($p < .05$) was present between the means of ratings by job type for Indicator 2 [Planning and Implementation]. Table 4.4 shows the means of ratings by participant groups with medians and modes for each job type per indicator. The results indicate that faculty or technology specialists may have found the document to be slightly more understandable than administrators.

When comparing rating means by the type of institution (2- or 4-year), once again, 2-year schools rated the indicators to be more understandable than their 4-year counterparts. Statistical analyses showed significant differences between institution types ($p < .01$) for Indicator 1 (Institutional Vision and Leadership Commitment), Indicator 3 (Resources and Support), and Indicator 4 (Assessment). While Indicator 2 (Planning and Implementation), did not show significance to a $<.05$ standard; it did come close at $p = .056$. An aggregate rating across all four indicators (Indicator 1 [Institutional Vision

Table 4.4

Understandability of Indicators—Means and Other Measures of Central Tendency by Job Type

Job type	Indicator #			
	1 Leadership & Commitment	2 Planning & Implementation	3 Resources & Support	4 Assessment
Administrators ($n = 31$)	5.67 med = 6 mode = 6	5.63 med = 6 mode = 6	5.60 med = 6 mode = 6	5.61 med = 6 mode = 6
Faculty ($n = 33$)	5.84 med = 6 mode = 6 ^a	5.75 med = 6 mode = 6	5.94 med = 6 mode = 6	5.75 med = 6 mode = 6
Technology specialists ($n = 33$)	5.72 med = 6 mode = 7	5.73 med = 6 mode = 7	6.19 med = 7 mode = 7	5.79 med = 6 mode = 6
Totals	5.74 med = 6 mode = 6	5.71 med = 6 mode = 6	5.91 med = 6 mode = 7	5.72 med = 6 mode = 6

^a Multiple modes exist—smallest value is shown.

and Leadership Commitment] + Indicator 2 [Planning and Implementation] + Indicator 3 [Resources and Support] + Indicator 4 [Assessment]) was also significant at $p = .012$.

Figure 4.5 illustrates the differences in means of ratings for the understandability of the indicators compared by institution type.

Despite previously described differences in ratings based on job and institution types, the means for ratings of all four indicators was determined to be “good,” which would be consistent with the notion that participants found the indicator document to be generally understandable.

Usefulness of the Indicators

To investigate the research question “To what extent are the indicators useful for the different target groups?” participants were asked to rate the usefulness of each indicator on a scale of 1 (low) to 7 (high). They rated usefulness along four categories; usefulness for institutional self-study, usefulness for planning for institution-wide web

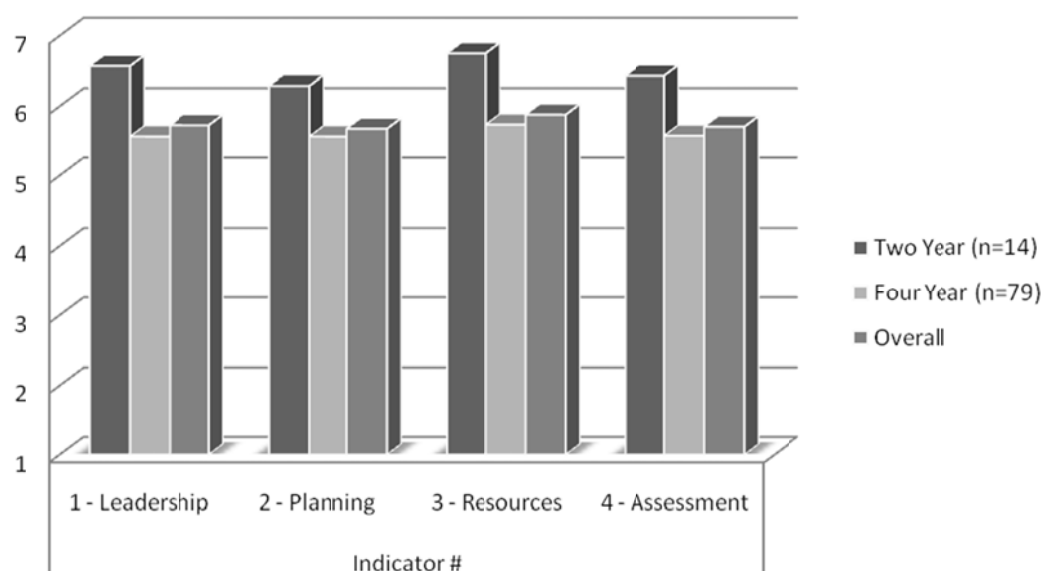


Figure 4.5. Understandability: Means for each rating by institution type.

accessibility, usefulness for accomplishing institution-wide web accessibility, and general usefulness.

The means of ratings for usefulness ranged from 5.76 (Indicator 4 [Assessment]—useful for planning) to 6.21 (Indicator 3 [Resources and Support]—generally useful). The results for usefulness as specified in the analysis section can be described as “good” for (Indicator 1 [Institutional Vision and Leadership Commitment]—useful for self-study and useful for achieving); (Indicator 2 [Planning and Implementation]—useful for achieving); and (Indicator 4 [Assessment]—useful for planning and useful for achieving). The results can be said to be “very good” for (Indicator 1 [Institutional Vision and Leadership Commitment]—useful for planning and generally useful); (Indicator 2 [Planning and Implementation]—useful for self-study, useful for achieving and generally useful); (Indicator 3 [Resources and Support]—useful for self-study, useful for planning , useful for achieving and generally useful); and (Indicator 4 [Assessment]—useful for self-study and generally useful) as specified by the evaluation metric described in the analysis section. However, while the median ratings remained in the 6s and 7s, across all categories and indicators, usefulness showed the greatest variability in ratings with the minimum rating means (excluding outliers—those ratings that were less than 1.5 times the lower quartile) ranging from 5 all the way down to 2. Figures 4.6-4.9 are box plots showing the distribution of ratings (1-7) for each Indicator across four categories (self-study, planning, accomplishing and general usefulness).

The means of ratings by indicator were analyzed by job type (administrator, faculty, tech specialist) and once again, administrators’ means were consistently lower

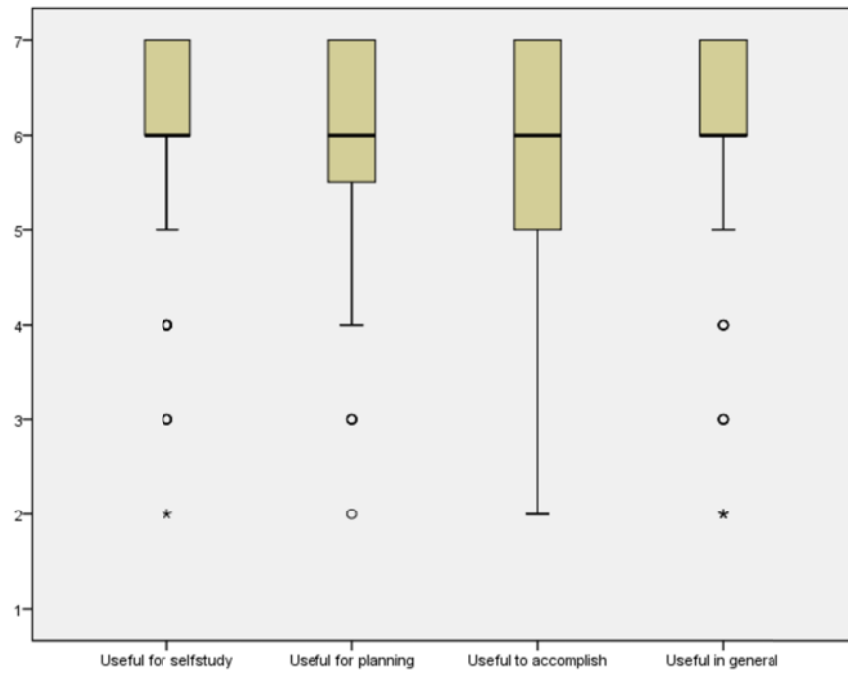


Figure 4.6. Box plot with medians and interquartile ranges show participant ratings of the categories of usefulness for indicator one based on a scale of 1 (low) to 7 (high), ($n = 97$).

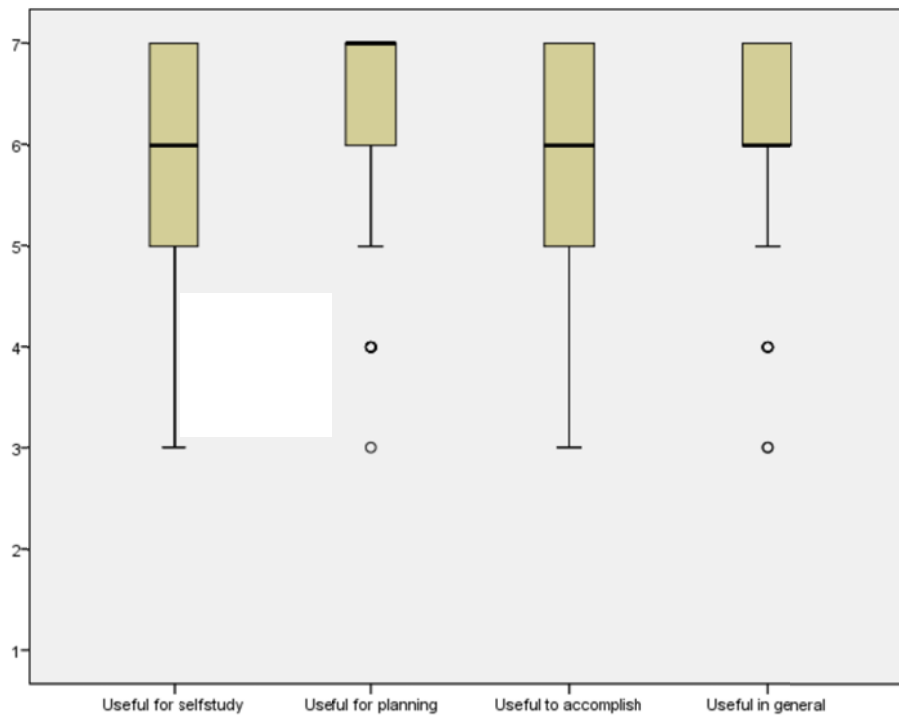


Figure 4.7. Box plot with medians and interquartile ranges show participant ratings of the categories of usefulness for indicator two based on a scale of 1 (low) to 7 (high), ($n = 97$).

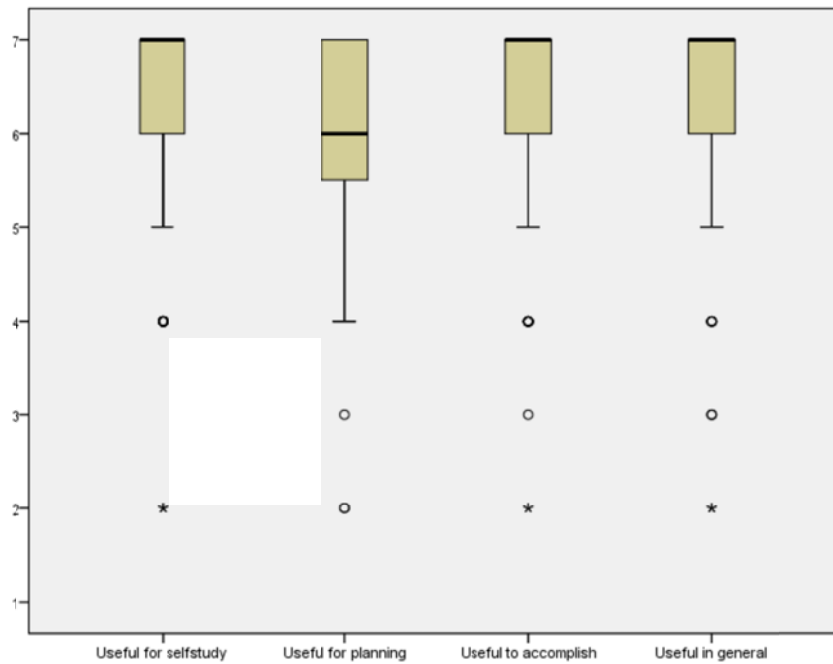


Figure 4.8. Box plot with medians and interquartile ranges show participant ratings of the categories of usefulness for indicator three based on a scale of 1 (low) to 7 (high), ($n = 97$).

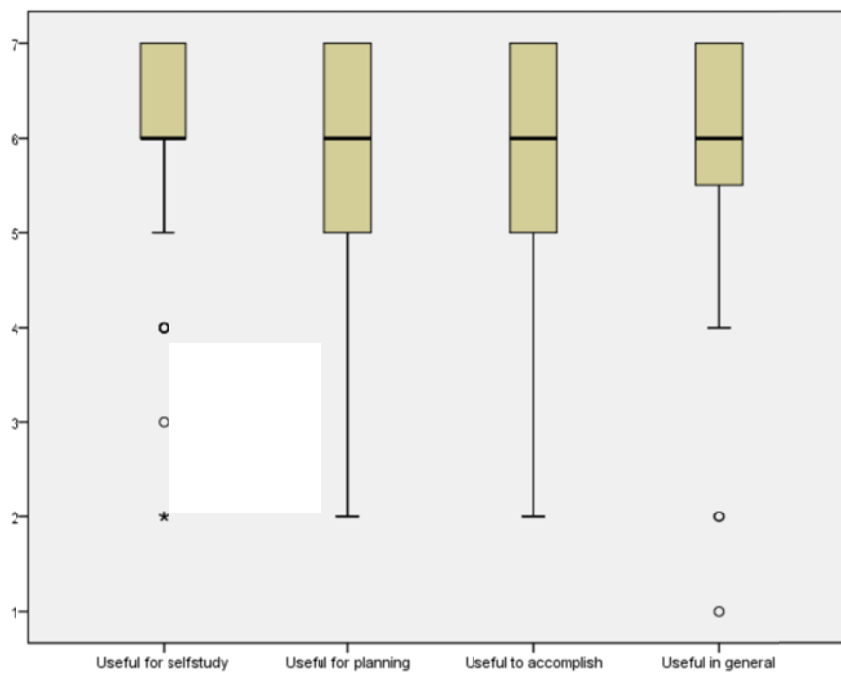


Figure 4.9. Box plot with medians and interquartile ranges show participant ratings of the categories of usefulness for indicator four based on a scale of 1 (low) to 7 (high), ($n = 97$).

than the other two groups with one exception—the technology specialists rated (Indicator 2 [Planning and Implementation]—useful for achieving) slightly lower than the administrators or faculty (see Table 4.5). Kruskal-Wallis analysis revealed that a statistically significant difference ($p < .05$) was present between the means of ratings by job type for (Indicator 1 [Institutional Vision and Leadership Commitment] useful for self-study) and (Indicator 3 [Resources and Support]—useful for self-study) and a statistically significant difference ($p < .01$) for (Indicator 3 [Resources and Support]—useful for planning). An aggregate rating was calculated for each indicator across all four categories of usefulness (usefulness for self-study + usefulness for planning + usefulness for achieving + general usefulness) with statistical significance ($p < .05$) found for Indicator 3 [Resources and Support]. Statistical significance ($p = .05$) was also found in an aggregate rating across indicators (Indicator 1 + Indicator 2 + Indicator 3 + Indicator 4).

The type of institution again appeared to have an impact on the participants' rating means across categories of usefulness. Two-year institutions rated the document higher than 4-year institutions with statistically significant differences ($p < .05$) found for (Indicator 2 [Planning and Implementation]—useful for self-study and useful for planning); (Indicator 3 [Resources and Support]—useful for planning); and (Indicator 4 [Assessment]—useful for self-study and useful for planning). Statistical significance ($p < .05$) was also found for the usefulness of self-study and usefulness for planning when calculating an aggregate rating across all four indicators (Indicator 1 + Indicator 2 + Indicator 3 + Indicator 4). These data indicate that participants from 2-year schools

Table 4.5

Means and Other Measures of Central Tendency by Job Type for Indicator Usefulness Categories

Job type	This indicator would be an effective measure as part of a <i>self-study</i> tool for an institution				This indicator would be useful in <i>planning</i> for system-wide web accessibility			
	<i>Indicator #</i>				<i>Indicator #</i>			
	1 Leadership & commitment	2 Planning & implementation	3 Resources & support	4 Assessment	1 Leadership & commitment	2 Planning & implementation	3 Resources & support	4 Assessment
Administrators (<i>n</i> = 31)	5.52 med = 6 mode = 7	5.77 med = 6 mode = 7	5.57 med = 5.5 mode = 7	5.84 med = 6 mode = 6	6.03 med = 6 mode = 6	5.90 med = 6 mode = 7	5.71 med = 6 mode = 7	5.52 med = 6 mode = 6
Faculty (<i>n</i> = 33)	6.13 med = 6 mode = 7	6.03 med = 6 mode = 6	6.34 med = 7 mode = 7	6.03 med = 6 mode = 6	6.31 med = 7 mode = 7	6.12 med = 6.5 mode = 7	6.25 med = 7 mode = 7	5.84 med = 6 mode = 6 ^a
Technology specialists (<i>n</i> = 33)	6.31 med = 7 mode = 7	6.03 med = 6 mode = 7	6.36 med = 7 mode = 7	6.28 med = 6 mode = 7	6.13 med = 7 mode = 7	6.03 med = 6 mode = 7	6.18 med = 7 mode = 7	5.91 med = 6 mode = 7
Totals	5.99 med = 6 mode = 7	5.95 med = 6 mode = 7	6.11 med = 7 mode = 7	6.05 med = 6 mode = 6	6.16 med = 7 mode = 7	6.02 med = 6 mode = 7	6.05 med = 6 mode = 7	5.76 med = 6 mode = 7
This indicator would be useful to <i>accomplish</i> system-wide web accessibility					I think this indicator is <i>generally</i> useful			
Administrators (<i>n</i> = 31)	5.74 med = 6 mode = 6	5.83 med = 6 mode = 7	5.93 med = 6 mode = 7	5.67 med = 6 mode = 6	5.90 med = 6 mode = 6	5.90 med = 6 mode = 7	5.86 med = 6 mode = 7	5.80 med = 6 mode = 7
Faculty (<i>n</i> = 33)	6.03 med = 6 mode = 7	6.19 med = 6 mode = 7	6.25 med = 7 mode = 7	5.91 med = 6 mode = 7	6.25 med = 6.5 mode = 7	6.13 med = 6 mode = 6 ^a	6.45 med = 7 mode = 7	5.90 med = 6 mode = 6
Technology specialists (<i>n</i> = 33)	6.00 med = 6.5 mode = 7	5.81 med = 6 mode = 7	6.15 med = 7 mode = 7	5.91 med = 6 mode = 7	6.22 med = 7 mode = 7	6.00 med = 6 mode = 6 ^a	6.29 med = 7 mode = 7	6.10 med = 6 mode = 6 ^a
Totals	5.93 med = 6 mode = 7	5.95 med = 6 mode = 7	6.12 med = 7 mode = 7	5.83 med = 6 mode = 7	6.13 med = 6 mode = 7	6.01 med = 6 mode = 7	6.21 med = 7 mode = 7	5.93 med = 6 mode = 7

^a Multiple modes exist—smallest value is shown.

found the indicators and overall document to be more useful than the participants from four-year institutions. Figures 4.10-4.13 illustrate the differences in means of participant ratings for usefulness of the indicators compared by institution type.

Overall, the participants' ratings varied across all the indicators and categories for usefulness. The usefulness of the document for self-study and usefulness for planning

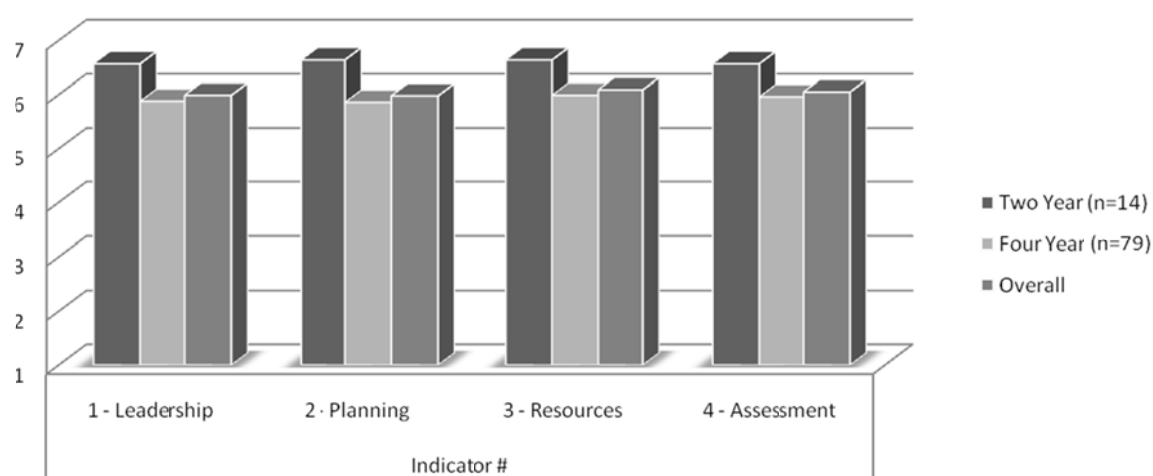


Figure 4.10. Usefulness of indicators for self-study: Means by each indicator's rating by institution type.

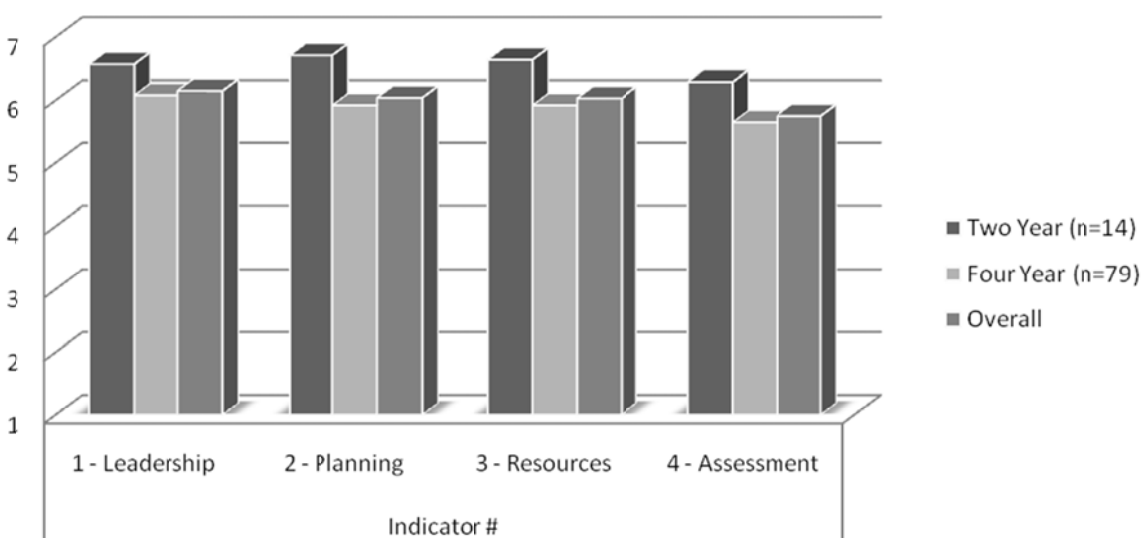


Figure 4.11. Usefulness of indicators for planning for institution-wide web accessibility: Means by each indicator's rating by institution type.

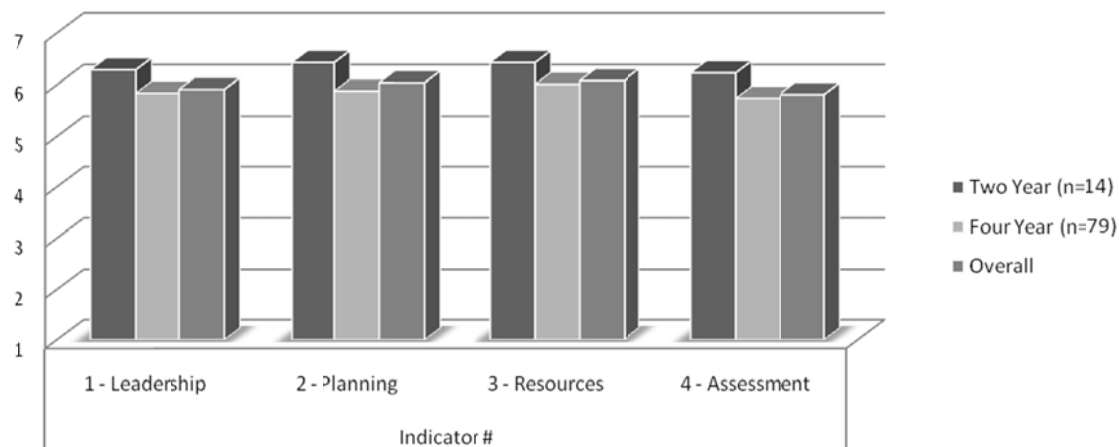


Figure 4.12. Usefulness of indicators for accomplishing institution-wide web accessibility: Means by each indicator's rating by institution type.

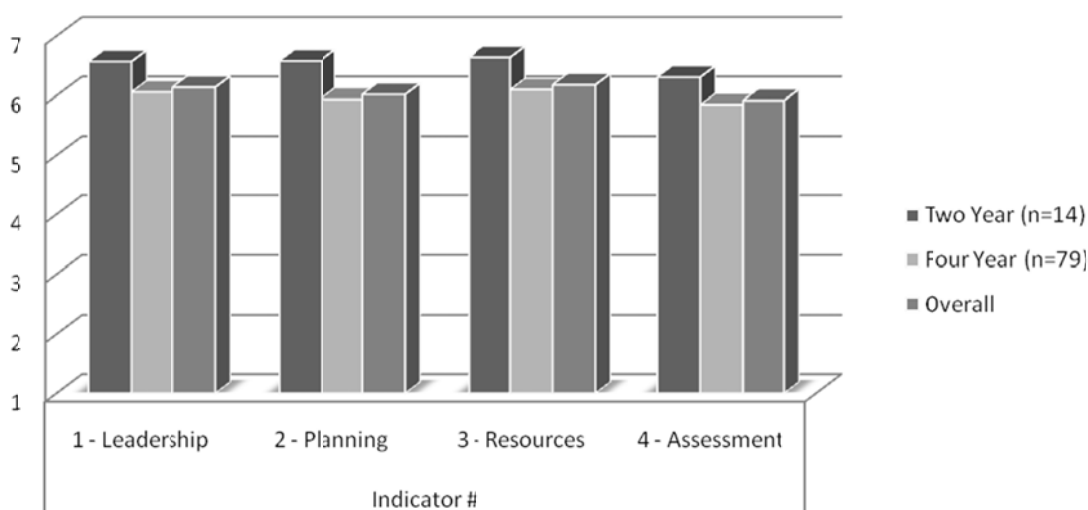


Figure 4.13. General usefulness of the indicators: Means by each indicator's rating by institution type.

appear to have the greatest variation of opinion across the board. However, despite these variations, overall ratings remained quite high indicating that the Indicators are perceived as a useful document for those interested in institution-wide web accessibility.

Satisfaction

To investigate the research question "What is the overall consumer satisfaction

with the indicators for the different target groups?” participants were asked to rate their satisfaction with the document on a scale of 1(low) to 7(high). They were asked to rate their satisfaction with each indicator (Indicator 1 [Institutional Vision and Leadership Commitment]; Indicator 2 [Planning and Implementation]; Indicator 3 [Resources and Support]; and Indicator 4 [Assessment]). They were also asked to rate their satisfaction with four aspects of the indicator document: the visual layout; the organization and structure of the information; the content; and their overall satisfaction.

The means of ratings for satisfaction ranged from 5.35 (visual layout) to 5.99 (Indicator 3 [Resources and Support]). The results across all indicators and aspects can be said to be “good” as specified by the evaluation metric described in the analysis section—over 75% of participants’ ratings were a 5 or above for Indicator 1 [Institutional Vision and Leadership Commitment]; Indicator 2 [Planning and Implementation] and Indicator 4 [Assessment] and can be said to be “very good” with at least 75% of the participants’ ratings a 6 or above for Indicator 3 [Resources and Support]. Additionally, the results for all four aspects met the criteria to be considered “good” (visual layout; the organization and structure of the information; the content; and overall satisfaction). The median rating was 6 for all four indicators and for all four aspects of the indicators. The minimum rating (excluding outliers—those ratings that were less than 1.5 times the lower quartile) range for each indicator ran from 4 for Indicator 3 [Resources and Support] to 2 for Indicator 2 [Planning and Implementation] and Indicator 4 [Assessment]. However, the minimum (5) and maximum ratings (7) for the different aspects of the indicators were consistent across all four aspects (visual layout, organization and structure, content and

overall). Figures 4.14 and 4.15 show the distribution of ratings (1-7) for each indicator.

In comparing the rating means across job type (administrator, faculty, tech specialist), the administrators again rated the document somewhat lower than the other groups with the exception of satisfaction with the structural organization where their average indicator means were higher than that for faculty or technology. However, none of the differences were found to be statistically significant. Tables 4.6 and 4.7 show the rating means, medians, and modes for each job type per indicator.

When comparing the type of institution (2- to 4-year), 2-year schools again rated the indicators higher than 4-year institutions at a statistically significant level ($p < .05$) for Indicator 1 [Institutional Vision and Leadership Commitment] and Indicator 2 [Planning and Implementation] and at a statistically significant level ($p = .01$) for Indicator 4 [Assessment]. An aggregate rating for satisfaction calculated across all four indicators

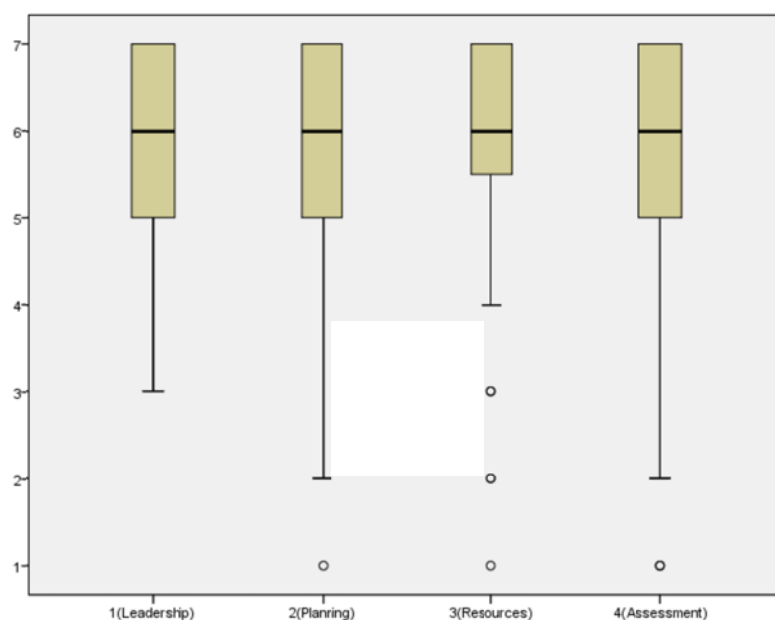


Figure 4.14. Box plot with medians and interquartile ranges show the satisfaction with each indicator based on a scale of 1 (low) to 7 (high), ($n = 97$).

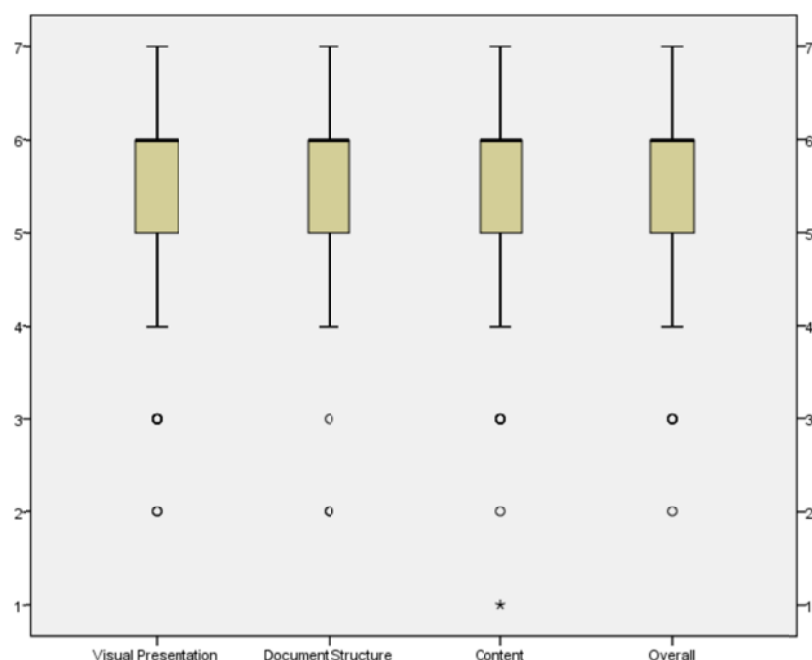


Figure 4.15. Box plot with medians and interquartile ranges show the satisfaction with aspects of the indicator document—based on a scale of 1 (low) to 7 (high), ($n = 97$).

(Indicator 1 + Indicator 2 + Indicator 3 + Indicator 4) also showed statistical significance ($p < .05$) in the difference between the ratings for 2- and 4-year schools. No statistically significant differences were found between the institution types for the four different aspects of the document (satisfaction with the visual layout, the organization and structure of the information, the content, and overall satisfaction). These data indicate that participants from 2-year schools were more satisfied with the indicator document than the participants from the 4-year schools. Figures 4.16 and 4.17 illustrate the differences in rating means for satisfaction of individual indicators and different aspects of the indicators compared by institution type.

Overall, there was some variability in satisfaction with the individual indicators but very little difference in the participants' satisfaction with the document's other

Table 4.6

Satisfaction with Individual Indicators: Means and Other Measures of Central Tendency by Job Type

Job type	Indicator #			
	1 Leadership & Commitment	2 Planning & Implementation	3 Resources & Support	4 Assessment
Administrators (<i>n</i> = 31)	5.42 med = 6 mode = 6	5.64 med = 6 mode = 6	5.58 med = 6 mode = 6	5.60 med = 6 mode = 6
Faculty (<i>n</i> = 33)	6.00 med = 6 mode = 6	5.87 med = 6 mode = 6	6.10 med = 6 mode = 7	5.61 med = 6 mode = 6
Technology specialists (<i>n</i> = 33)	5.87 med = 6 mode = 7	5.77 med = 6 mode = 6	6.23 med = 7 mode = 7	6.03 med = 6 mode = 6 ^a
Totals	5.76 med = 6 mode = 6	5.76 med = 6 mode = 6	5.99 med = 6 mode = 7	5.75 med = 6 mode = 6

^a Multiple modes exist—smallest value is shown

Table 4.7

Satisfaction with Aspects of the Indicator Document: Means and Other Measures of Central Tendency by Job Type

Job type	Satisfaction with the visual presentation/ layout of the indicator document	Satisfaction with structural organization of the indicators (e.g., three tiers or levels of information)	Satisfaction with the content of the indicator document	Overall satisfaction with the indicator document
Administrators (<i>n</i> = 31)	5.26 med = 5 mode = 7	5.74 med = 6 mode = 6	5.29 med = 6 mode = 6	5.45 med = 5 mode = 5
Faculty (<i>n</i> = 33)	5.52 med = 6 mode = 6	5.73 med = 6 mode = 6	5.61 med = 6 mode = 6	5.58 med = 6 mode = 6
Technology specialists (<i>n</i> = 33)	5.27 med = 5 mode = 5	5.58 med = 6 mode = 6	5.55 med = 6 mode = 6	5.64 med = 6 mode = 6
Totals	5.35 med = 6 mode = 6	5.68 med = 6 mode = 6	5.48 med = 6 mode = 6	5.56 med = 6 mode = 6

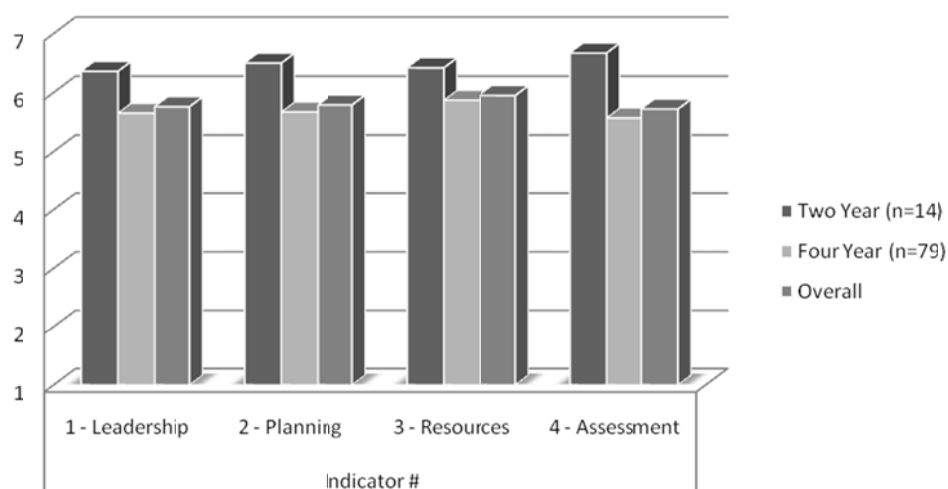


Figure 4.16. Satisfaction of the individual indicators: Means by each rating by institution type.

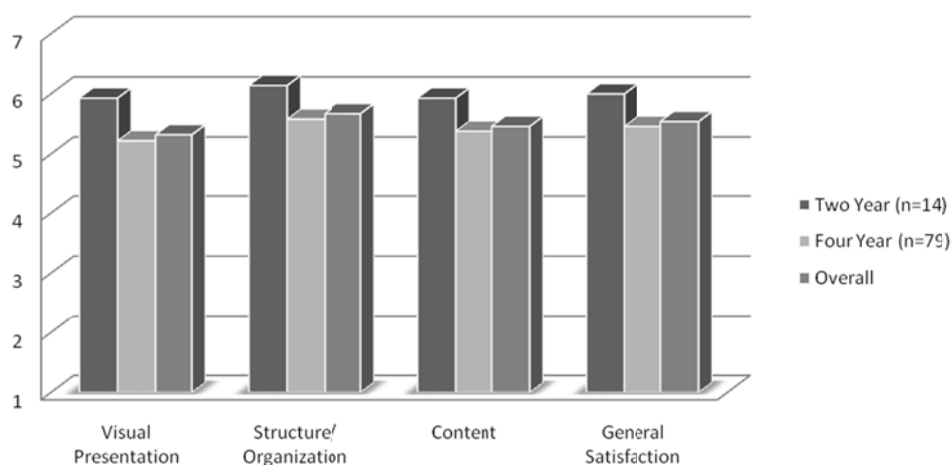


Figure 4.17. Satisfaction of different aspects of the indicators: Means by each rating by institution type.

aspects (visual layout, the organization and structure of the information, the content and overall satisfaction). Satisfaction with the visual presentation ranged the lowest across the entire survey with participants using the survey's comment boxes to indicate that elements such as background graphics and logos were distracting. Based on these comments, the visual layout was redesigned, taking into account these criticisms. Other issues that arose in the comments such as a need for definitions and a sense that the

wording in some places was awkward or too dense were used to improve not only the indicator documents but also the GOALS Benchmarking and Planning tool as well.

With rating means in the mid to high 5s, satisfaction had some of the lowest rating means in the survey. However it is believed that the changes made to the layout and wording will help to improve the overall satisfaction for future users.

Overall Results

Tables 4.8 and 4.9 show the results using the criteria described in the analysis section of this paper (i.e., more than 75% of participants providing a rating within a certain range). The results show that each question (appropriateness, understandability, usefulness and satisfaction); category (useful for self-study, useful for planning, useful for achieving and overall usefulness); and aspect (visual, structure, content and overall satisfaction) across all four indicators (Indicator 1 [Institutional Vision and Leadership Commitment], Indicator 2 [Planning and Implementation], Indicator 3 [Resources and Support], and Indicator 4 [Assessment]) can be considered to be either “good” or “very good.” The overall data would indicate that the indicator document is appropriate for providing a framework for web accessibility, is understandable, useful, and satisfactory. Data also showed that administrators consistently rated the document somewhat lower than that of faculty or technology specialists and participants from 2-year schools rated the document higher than participants from 4-year schools. While not all differences were statistically significant, consistent trends provide a practical significance that can, and will, inform ongoing development of materials to assist institutions in ensuring their websites are accessible to all—including those with disabilities.

Table 4.8

Score and Rating at the 75% Cut-Off Criteria Used for Evaluation of Research Questions by Indicator and the Actual Percentage for That Score

Variable	1 Leadership & commitment		2 Planning & implementation		3 Resources & support		4 Assessment	
	75% cut off rating	Actual % for rating	75% cut off rating	Actual % for rating	75% cut off rating	Actual % for rating	75% cut off rating	Actual % for rating
Appropriate—own	6 “very good”	75.8	6 “very good”	76.6	6 “very good”	75.5	6 “very good”	75.8
Appropriate—other	6 “very good”	76.8	6 “very good”	80.2	6 “very good”	78.8	6 “very good”	78.7
Understandable	5 “good”	83.9	5 “good”	85.3	5 “good”	84.9	5 “good”	86.5
Useful for self-study	5 “good”	87.2	6 “very good”	75.8	6 “very good”	76.8	6 “very good”	82.1
Useful for planning	6 “very good”	75.8	6 “very good”	75.0	6 “very good”	75.0	5 “good”	85.4
Useful for achieving	5 “good”	85.3	5 “good”	87.2	6 “very good”	76.8	5 “good”	87.4
Useful in general	6 “very good”	77.9	6 “very good”	79.6	6 “very good”	81.3	6 “very good”	75.0
Satisfaction	5 “good”	87.1	5 “good”	88.8	6 “very good”	75.0	5 “good”	88.0

Table 4.9

Score and Rating at the 75% Cut-Off Criteria Used for Evaluation of the Participants’ Satisfaction with Aspects of the Indicator Document and the Actual Percentage for That Score

Aspect of indicator	Actual percentage for rating	Actual % for rating
Visual layout	5 “good”	75.3
Structure	5 “good”	88.7
Content	5 “good”	80.4
Overall satisfaction	5 “good”	86.6

Discussion

While the participants' job and institution types did appear to have an impact on the participant's opinions of the indicator document, the evaluation results for all questions of appropriateness, understandability, usefulness, and satisfaction met the criteria to be judged either "good" or "very good" and the median ratings for each question were a 6 or 7 across the board. These findings would indicate that while different characteristics of the indicator document may appeal to different groups, participant ratings across job and institution type show results that validate the use of the indicators as a tool to assist institutions in their web accessibility efforts. It should be noted however, that this study used a convenience sample of volunteers who may have participated due to an existing interest in web accessibility. This factor may, in part, have influenced the participants' ratings and attitudes toward the indicator document. Therefore, care should be taken in generalizing the results to a larger population.

Two distinct trends emerged that merit discussion. First, administrators consistently rated the document lower than either faculty or technology specialists even when those differences were not statistically significant at a $p < .05$ level. There are many factors that may contribute to this disparity. First, and most importantly, management and administration have traditionally been somewhat removed from the process of ensuring that students (and others) with disabilities had adequate access—this responsibility was the realm specifically relegated to the office for disability services and they were in charge of providing accommodations (Kuusisto, 2009). However, content within the indicator document requires that members from all areas of the institution are directly

involved in working to promote and ensure a system supportive of an accessible web presence—and a large portion of that responsibility lies with the administration. As was stated earlier in this paper, system-level change is necessary to adequately promote and maintain web accessibility in postsecondary institutions (WebAIM, 2004)—and while that change must come from the top, it is possible that administrators may look at this requirement as yet one more thing that they must add to an already overfilled plate.

Furthermore, achieving institution-wide web accessibility requires resources of both time and money: collaboration, an adequate budget, ongoing evaluation and maintenance, appropriate timelines and personnel time and effort allowances are factors which indicate serious commitment to web accessibility (Harper & DeWaters, 2009). This commitment can be a challenge in the best of times. However, in today's postsecondary environment, budgets are stretched beyond the breaking point and faculty and staff are already overcommitted. While administrators have, in the past, agreed with the importance of web accessibility in theory, it is not high on their priority list (WebAIM, 2004). This stance is starting to change however; litigation from both students and staff has resulted in increased costs and penalties (Waddell, 2007) and evidence is starting to show that web accessibility benefits both the quality of the institution and the bottom line (Mariger et al., 2010). In fact, the 2009 Campus Computing Project found that ADA Compliance was among CIO's top issues confronting online education over the next 2-3 years.

Finally, web accessibility is a complex thing; administrators and faculty often do not have the necessary understanding of accessibility to even start the discussion. While

there are any number of resources for web developers, little has been created that nontechnical personnel can understand. Thus, it may be difficult for administrators to articulate what is required for their institutions. In this respect, the indicators document, while a good outline of best practices, does not provide the scaffolding that can help guide the process along. When asked if anything should be added to the document, examples and checklists were common requests. It is hoped however, that this critique can be answered by the next (and final) product that the GOALS team has developed—the Benchmarking and Planning Tool. Currently in field testing, the tool uses the indicators discussed in this article as a blueprint, leading an institution's web accessibility team through a series of questions that can help evaluate the state of an institution's web accessibility, determine what areas need work and then guide the team in creating an action plan for developing and improving institution-wide web accessibility.

A second trend in the data was seen across the different rating means from two-year and four-year schools. While not all of these differences were statistically significant, in every case, the 2-year schools' rating means were higher than that of 4-year schools. This knowledge of the differences in opinions and attitudes between institution types could be very useful when thinking about approaches to web accessibility at each type of institution.

It should be noted that the sample between institution types was disproportionate with a considerably higher number of participants from 4-year institutions ($n = 79$) than 2-year schools ($n = 14$). While the use of nonparametric analyses helped to adjust for the disparity in numbers, in future studies, it may be advisable to consider incorporating a

mechanism to recruit a more balanced participant base. However, the differences in ratings also tally with the findings of a 2009 GAO report which found that “students with disabilities attended two-year schools at a higher rate than their peers and four-year schools at a lower rate” (US GAO, 2009). The report theorized that 2-year schools may provide better access and specialized services for students with disabilities along with smaller classes and more personal attention from the faculty. Burgstahler (2009) noted that “Individuals with disabilities are under-represented in four-year postsecondary academic programs, particularly in technical fields such as science, mathematics, engineering, and technology.” Furthermore students with disabilities wishing to transition from 2- to 4-year schools face a number of challenges including differences in academic requirements, inadequate self-advocacy skills, a lack of mentors with disabilities, differences in disability services, changes in disability documentation requirements, and a larger, less personal environment where it is more difficult to make friends and get to know faculty. Thus, it is possible that the issue of disability access is more relevant to schools that interact at higher levels with those with disabilities, and that this experience was reflected in the differences across rating means of the school types.

Conclusion

The US GAO (2009) estimated that the number of postsecondary students with some form of disability has grown from 9% in 2000 to almost 11% in 2008 and with the enactment of the Post-9/11 GI Bill, school officials are anticipating an increase in the number veterans with disabilities seeking postsecondary education. Schools hoping to recruit and retain these students will need to ensure that they have the necessary tools to

succeed—and an accessible web presence sends the message that an institution understands, and is responsive to, the needs of its constituents.

While there is no magic panacea for web accessibility, there are tools and processes available that can assist institutions in creating an equitable playing field for all their students, faculty, staff and alumni. The results of this survey show that the Institutional Indicators created by Project GOALS are appropriate, understandable, useful and provide consumer satisfaction for those wishing to incorporate or improve web accessibility on their campus and beyond. It is hoped that the materials developed by GOALS will have utility for institutions well into the future.

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CHAPTER 5

ATTITUDE IS EVERYTHING—OR IS IT?³

Key Takeaways

- Institution-wide web accessibility is essential to ensure full participation in the modern academic environment.
- Most institutions' web presences are not accessible.
- Project GOALS has developed a set of Institutional Indicators to aid postsecondary institutions in improving their web accessibility.
- A validation study found that the Indicator Document was appropriate, understandable, useful and satisfactory for administrators, faculty and technology specialists.
- Technology specialists were most familiar with web accessibility but rated it as less important than administrators or faculty and all groups rated the importance of web accessibility to themselves greater than to their institutions.
- In general, those who had been in their positions the shortest amount of time rated the document higher than those who had been in their positions longer.

Introduction

The U.S Census Bureau estimates that 54.4 million (or 19%) of Americans have some form of disability (US Census Bureau, 2008). Luckily, having a disability no longer means exclusion or inequity from everyday life activities:

No matter how significant the impairment caused by a disability, assistive technology can do much to mitigate that impairment. Through assistive technology, people with disabilities both hidden and significant can lead fulfilling lives in their communities. (Disability Services Beacon, 2005)

³ This paper is coauthored by Cyndi Rowland and will be submitted to *Educause Quarterly*.

Thanks, in part, to modern technology, educational opportunities for students with disabilities are on the rise (US GAO, 2009). An estimated 22 million (or 11%) of undergraduates (US Census Bureau, 2007) and 6.7% of graduate and first professional degree students (IES, 2005) reported some form of disability during the 2003-4 school year. The US GAO (2009) has estimated that the number of postsecondary students with some form of disability has grown from 9% in 2000 to almost 11% in 2008. Moreover with the enactment of the Post-9/11 GI Bill, school officials are anticipating an increase in the number veterans with disabilities seeking postsecondary education.

The Internet and digital media have likewise been instrumental in expanding the educational prospects for students with and without disabilities. Online enrollment in higher education venues is growing at a substantial rate. Over 25% of postsecondary students (about 4.6 million) enrolled in at least one online course during the fall of 2008—a 17% increase over the previous year (Allen & Seaman, 2010) and the number of students taking online courses is expected to rise from the current 12 million to over 22 million by 2014 (Nagel, 2009). Online courses are only the tip of the iceberg, a 2008 student survey found that students spent an average of 19.6 hours a week doing online activities for work, school or recreation (Caruso & Salaway, 2008). Furthermore, recent studies have found that:

- 33% of students indicate a willingness to purchase electronic textbooks (Nagel, 2007),
- 59% said they used online study aids (Nagel, 2007),
- 78% used online quizzing (Nagel, 2007),
- 93.4% used the college or university website on a weekly basis (Caruso & Salaway, 2008),

- 80.2% of students prefer to learn by running Internet searches (Caruso & Salaway, 2008), and
- 82.3% of students used a course management system (CMS) several times a week (Caruso & Salaway, 2008).
- Of the 85% of students using social networking sites 49.7% report having integrated them into their academic lives. (Caruso & Salaway, 2008)

The Internet plays an important part before students even get to school—over 65% of college bound students reported that the web was more valuable than print resources in determining the postsecondary institution they wished to attend (in *Christian Science Monitor* as cited in Irwin & Gerke, 2004). This growing popularity of the Internet has made it essential not only for studies, but also everyday lives. Unfortunately, assistive technology alone cannot overcome many of the access problems created by improperly designed or formatted websites (Schmetzke, 2001) and students with disabilities facing inaccessible sites are limited in their opportunities to participate in the educational experience and learn essential life skills (WebAIM, 2004).

While not every person with a disability is affected by web accessibility issues, it is estimated that 8.5% of the population has at least one disability that impacts computer and Internet use (Waldrop & Stern, 2003). This number may be even higher according to a study commissioned by the British advocacy group Shaw Trust (2009), which found that 17% of British adults—almost 8 million people—may be affected by inaccessible websites. Those with disabilities often include students, employees and alumni in postsecondary education.

Is That Legal?

The US does have some protections in place to ensure that persons with disabilities receive equal treatment under the law. The ADA Title III specifies that “public accommodations must comply with basic nondiscrimination requirements that prohibit exclusion, segregation, and unequal treatment” (ADA, 2005). Furthermore, an amendment to the Rehabilitation Act of 1973—Section 504, mandates that any employers or organizations that receive federal financial assistance are required to adhere to a policy on nondiscrimination. All government agencies, federally funded projects, K-12 schools, and postsecondary entities (state colleges, universities, and vocational training schools) fall into this category (WebAIM, 2005). However, these laws were written with a physical environment in mind and there is some question as to how they apply to a digital world. Recently, lawsuits such as the NFB v. Target, in which an inaccessible website is cited as comparable to an inaccessible brick and mortar storefront are expanding the rules of practice in advanced countries to include virtual environments as well (Smith, 2006).

Responding to the growing impact of computers and the Internet, a 1998 amendment to Section 508 of the Rehabilitation Act includes a provision to ensure the accessibility of electronic and information technology for persons with disabilities. This amendment states that Federal departments and agencies that create, buy, use, or maintain electronic or information technology will assume responsibility for ensuring that all technology and information is available to those with a disability in a comparable manner as those without disabilities (Paciello, 2000, pp. 33-34). While Section 508 relates to Federal agencies, it has also been adopted by a growing number of states and higher

education institutions through executive orders or administrative policies (Waddell, 2007).

In 2010 the Assistant Attorney General for Civil Rights, Samuel Bagenstos, testified before the House Judiciary Subcommittee and discussed the gap that exists between current legislation and technology. He stated that while the ADA regulations were written before the Internet came into general use, the intent of the legislation was to ensure equal access to all aspects of civic and economic life and that the laws should be interpreted to keep pace with developing technology (Bagenstos, 2010). This sentiment was echoed by Assistant Attorney General Thomas Perez in a letter to college and university presidents expressing concern over institutional use of electronic books such as the Kindle DX which are not accessible to students who are blind or have low vision, noting, “It is unacceptable for universities to use emerging technology without insisting that this technology be accessible to all students” (Dale, 2010).

In an effort to address this disparity between the current laws and technology, the DOJ has issued an “Advance Notice of Proposed Rulemaking on the Accessibility of Web Information and Services Provided by Entities Covered by the ADA.” The department is considering options, reviewing resources and evaluating the over 11,000 public comments regarding revised regulations for Titles II and III of the ADA to include web accessibility for persons with disabilities (Regulations.gov, 2011; US DOJ, 2010).

So Why Are We Still Talking About It?

Despite these regulations and an acknowledged need, the current level of web

accessibility across the nation leaves much to be desired. While individual champions have created pockets of accessibility on some campuses, these efforts are often hit-and-miss as, even accessible web pages are impossible to use if they are buried amongst inaccessible ones (Rowland, 2007). A truly accessible and inclusive web presence requires commitment and action on an organizational scale (WebAIM, 2004). In other words, effective change must be system-wide.

As web accessibility garners increased importance and attention, there is greater emphasis on making system-wide, rather than individual, changes in our efforts to create a more accessible world. This [mission] is accomplished through policy setting and implementation that places the importance of web accessibility alongside other web considerations. (Rowland & Mariger, 2007)

Sadly, web accessibility is not a priority for a majority of higher education institutions. The practice of universal design—designing materials (both physical and digital) to be usable by all people, including those with disabilities—has gained a foothold in K-12 education. But, those in higher education have been much slower to adopt the concept (Harper & DeWaters, 2008). Furthermore, studies almost a decade apart (in 1999 and 2008) found that web accessibility on pages one step down from a sample of postsecondary institutions remained low with only 3% of pages free of potential accessibility vulnerabilities (NCDAE, 2008; Rowland & Smith, 1999).

This is not to say that the entire postsecondary web landscape is bleak. Many individual institutions such as the University of Washington, Ohio State University and the University of Wisconsin at Madison have enforced institution-wide web accessibility policies (JHU, 2008) and full systems of education including the California Community College and the California State University Systems are also mandating an accessible

web presence (Rowland & Mariger, 2007).

Project GOALS

This trend toward accessibility is one that we at Project GOALS hope to encourage with help from a grant from the FIPSE to develop, evaluate, and disseminate materials and processes in web accessibility that institutions of higher education can use in their efforts to ensure that online content is accessible to all users. Over the past 3 years, Project GOALS has developed a set of materials including:

1. An Action Paper to raise the awareness of the need for web accessibility.
2. A document of Institutional “Indicators” that outlines best practices for electronic-accessibility in education.
3. A Web Accessibility Benchmarking and Planning Tool to assist institutions in assessing, planning, tracking and improving an institution’s web accessibility. (Project GOALS, 2009).

The second product, the Institutional Indicators identified four key criteria (or indicators) necessary for institution-wide web accessibility:

1. Institutional Vision and Leadership Commitment;
2. Planning and Implementation;
3. Resources and Support; and
4. Assessment.

These indicators were further broken down into benchmarks and evidence creating an outline that administration can use to help scaffold the issue of web accessibility at their institutions. To view an online copy of the indicators, visit <http://www.ncdae.org/goals/indicators.php>.

The indicator document is the skeleton upon which the final product, the Benchmarking and Planning Tool, is built. Therefore, it was essential that the indicator document be appropriate, understandable, and useful for providing a framework for institution-wide web accessibility. Furthermore, we wanted the products to be applicable to a wide selection of institutions and audience. In order to establish the viability of the indicators and to gauge consumer satisfaction with them, we conducted a social validation study on the indicator document during the summer and fall of 2009.

Methodology

In order ascertain to what extent the indicator document was suitable for the different target groups, we investigated five questions.

1. To what extent are the indicators *appropriate* for the purpose of providing a framework for web accessibility?
2. To what extent are the indicators *understandable* for the different target groups?
3. To what extent are the indicators *useful* for the different target groups?
4. What is the overall consumer *satisfaction* with the indicators for the different target groups?
5. To what extent are the indicators comprehensive enough to allow for differences across the different target groups?

Instrumentation

The study took the form of an online survey using LimeSurvey (limesurvey.org),

an open source survey engine. Ironically, an exploratory study to validate the instrument found that there were some accessibility problems with the program. Therefore, we found a local programmer who could work with LimeSurvey's open source community to ensure that the final survey was fully accessible for persons with disabilities. The participants' responses were automatically ported to a database and downloaded into SPSS for analysis.

We divided the questionnaire into seven sections: demographics; questions regarding the respondent's attitude and knowledge regarding web accessibility; sections regarding each of the four individual indicators (1-4); and an overall/summary page. The questionnaire used a 7-point Likert-type scale and a small number of discrete (yes/no) questions to measure the subjective opinions of the participants. Open ended questions probed the reasons for their responses and provided a mechanism for additional participant feedback.

Recruitment of Participants

For participants, we drew from Project GOALS partners: representatives from the WICHE, Kentucky's CPE, SREB, and WebAIM. The representatives were each asked to recruit 10 administrator, 10 faculty, and 10 technology specialists from postsecondary institutions. Our target was a minimum of 30 participants per interest group (see Appendix 4 for a sample recruitment letter).

Ninety-seven completed surveys were returned, thus exceeding our target of 30 surveys per target group. Tables 5.1 and 5.2 show the participants by job and institution types and the mean length of time the participants had been in their positions by job type.

Table 5.1

Participant Counts by Job and Institution Types

Job type	Institution type			Totals
	2-year	4-year	Other ^a	
Administrators	7	24	0	31
Faculty	3	29	1	33
Technology specialists	4	26	3	33
Totals	14	79	4	97

^aInstitution type—Other = Board of Regents, Board Office, and Medical School

Table 5.2

Mean Length of Time in Job by Institution Type

Job type	Number of years
Administrators ($n = 31$)	12.00 $s = 7.12$ $r = 1-27$
Faculty ($n = 33$)	12.67 $s = 8.58$ $r = 2-39$
Technology specialists ($n = 33$)	9.00 $s = 5.45$ $r = 1-23$
Totals	11.21 $s = 7.27$ $r = 1-39$

Analysis

Descriptive statistics (e.g., mean, median, mode and standard deviation) were run for each of the questions. For the purposes of distilling participant data into meaningful results, a minimum criteria was set as the threshold for success across the research questions. The criteria was based on the preponderance of participant responses. A result will be considered to be “very good” if at least 75% of participant ratings were a 6 or above (on a 7-point scale). A result will be considered to be “good” if 75% of participant ratings were a 5 or above. The same logic will be used to determine “average” (i.e., 75%

of participant ratings at 4 and above), as well as “poor” (i.e., 75% of participant ratings were at 3 and above).

Inferential statistics were also utilized in order to look for differences between the data. Achyar (2008) suggested that as Likert-type data is ordinal in nature, nonparametric tests are the appropriate measures for analyzing data. As such, we used chi square analyses for yes/no questions, Kruskal-Wallis for Likert-type responses, and Mann Whitney U for limited answer questions to look for differences across the different demographic groups. Cronbach’s alpha was used to check for robustness across the indicators and between the dimensions of appropriateness, usefulness and satisfaction.

Results and Discussion

We asked the respondents about their participation in web planning groups and about their experiences participating in institutional self-study. Of those that responded that they had participated in these activities, we inquired whether these experiences included a web accessibility component. Figures 5.1 and 5.2 show the breakdown of group participation by job type.

A full 83% of web planning groups reportedly did include web accessibility in their work. However, these results are not necessarily typical given the potential for sampling bias in a volunteer sample and it is likely that these levels would not be generalizable to the broader population. Even so, this finding means that for approximately one out of every five of these groups, web accessibility was not even considered. Given the importance of an accessible web to the one in five persons who

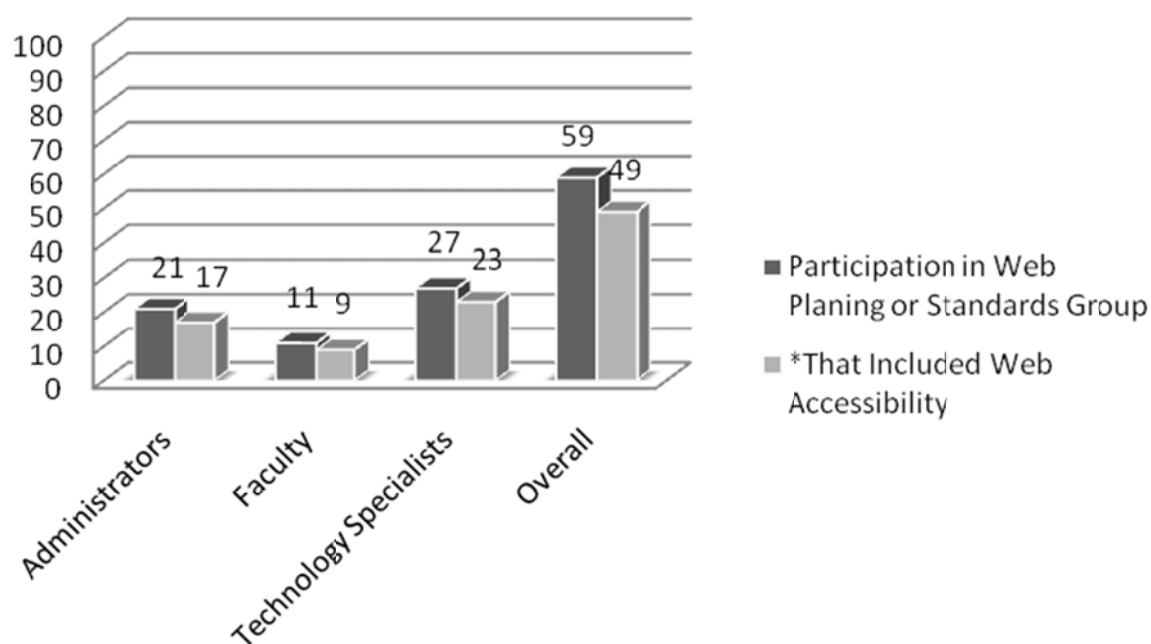


Figure 5.1. Involvement with web groups by job type: Count by job type ($n = 97$).

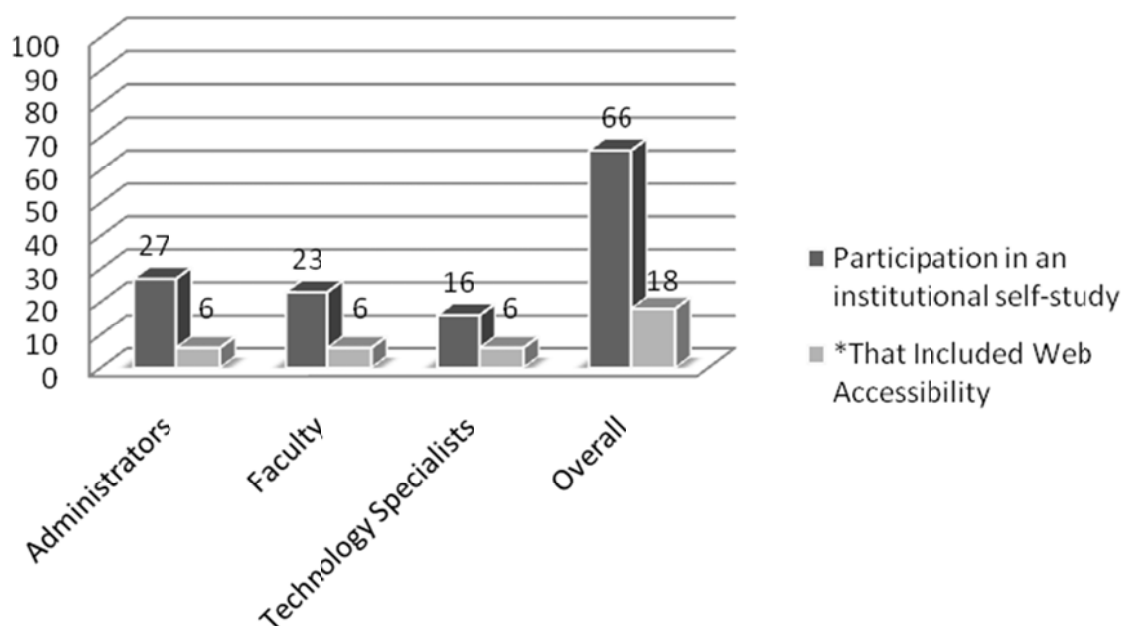


Figure 5.2. Involvement with self-study by job type: Count by job type ($n = 97$).

have or will experience a disability in their lifetime (US Census Bureau, 2008), it is hoped that web accessibility will soon be a standard consideration in all web planning meetings.

The numbers for the inclusion of web accessibility in self-study were considerably lower with an overall positive response of 30%. This finding presents an opportunity. Given that the self-study process can be used as a catalyst for strategic change within an organization (Martin, Manning, & Ramaley, 2001) and that most institutions list a commitment to diversity and a policy of nondiscrimination as part of their institutional mission statements (Mariger, 2008), self-study may be a viable option for those institutions wishing to enact system-wide web accessibility. It is for this reason that both the Indicator document and the Benchmarking and Planning tool were developed by Project GOALS; to be used to assist institutions in self-study and continuous quality improvement.

Appropriateness of Indicators

Participants were asked to rate the appropriateness of the indicators for both their own and another institution on a scale of 1(low) to 7(high). Scores ranged from 6.2 (Indicator 3 [Resources and Support]—another institution) to 5.98 (Indicator 4 [Assessment]—their own institution). It is interesting to note that in all but one case (Indicator 3 [Resources and Support]—faculty), participants rated the document as more appropriate for another institution than their own. The results for appropriateness for providing a framework for web accessibility can be said to be “very good” as specified by the evaluation metric described in the analysis section. Over 75% of the ratings for all

indicators (for both their own and other institutions) were either 6s or 7s. Table 5.3 shows the rating means by indicator for all three target groups.

Clarity of Indicators

Participants were asked to rate the understandability of each of the indicators on a scale of 1 (low) to 7 (high). The rating means for understandability ranged between 5.71 for Indicator 2 [Planning and Implementation] and 5.91 for Indicator 3 [Resources and Support]. The results for understandability can be said to be “good” as specified by the evaluation metric described in the analysis section as over 75% of the ratings for all indicators were a 5 or above. Table 5.4 shows the rating means by indicator for all three target groups.

Table 5.3

Appropriateness of the Individual Indicators as a Framework for Institution-Wide Web Accessibility: Rating Means by Job Type—Scale 1 (low) to 7 (high)

	How appropriate is this indicator as part of a framework for considering web accessibility at <u>your</u> institution?				How appropriate is this indicator as part of a framework for considering web accessibility at <u>another</u> institution?			
	Indicator #				Indicator #			
	1 Leadership	2 Planning	3 Resources	4 Assessment	1 Leadership	2 Planning	3 Resources	4 Assessment
Administrators	5.77* s=.990	6.06 s=.964	5.90 s=.960	5.81 s=1.108	5.83 s=1.002	6.07 s=.961	5.93 s=1.016	5.86 s=1.093
Faculty	6.13 s=1.100	5.97 s=1.140	6.39 s=.989	5.97 s=1.224	6.32 s=.905	6.03 s=1.098	6.37 s=.999	6.03 s=1.217
Technology specialists	6.28 s=1.198	6.06 s=1.162	6.27 s=.977	6.15 s=.755	6.36 s=.907	6.22 s=1.050	6.30 s=1.031	6.27 s=.740
Totals	6.06 s=1.109	6.03 s=1.082	6.19 s=.987	5.98 s=1.041	6.16 s=.962	6.10 s=1.029	6.20 s=1.021	6.06 s=1.037

* Statistical differences found between job types: ($p < .05$).

Table 5.4

Understandability of the Individual Indicators: Rating Means by Job Type—Scale 1 (low) to 7 (high)

Job type	Indicator #			
	1 Leadership & Commitment	2 Planning & Implementation	3 Resources & Support	4 Assessment
Administrators	5.67 s = 1.124	5.63 s = 1.129	5.60* s = 1.070	5.61 s = 1.145
Faculty	5.84 s = 1.068	5.75 s = 1.078	5.94 s = 1.243	5.75 s = 1.016
Technology specialists	5.72 s = 1.611	5.73 s = 1.547	6.19 s = 1.327	5.79 s = 1.293
Overall	5.74 s = 1.285	5.71 s = 1.262	5.91 s = 1.231	5.72 s = 1.149

* Statistical differences found between job types: ($p < .05$)

Usefulness of Indicators

Participants were asked to rate the usefulness of each of the indicators on a scale of 1(low) to 7(high). They rated usefulness along four measures; effectiveness for self-study, effectiveness for planning, effectiveness for accomplishing, and general usefulness. The scores ranged from 5.76 (Indicator 4 [Assessment]—useful for planning) to 6.21 (Indicator 3 [Resources and Support]—generally useful). The results for usefulness as specified in the analysis section can be described as “good” for (Indicator 1 [Institutional Vision and Leadership Commitment]—useful for self-study and useful for achieving); (Indicator 2 [Planning and Implementation]—useful for achieving); and (Indicator 4 [Assessment]—useful for planning and useful for achieving). The results can be said to be “very good” for (Indicator 1 [Institutional Vision and Leadership

Commitment]—useful for planning and generally useful); (Indicator 2 [Planning and Implementation]—useful for self-study, useful for achieving and generally useful); (Indicator 3 [Resources and Support]—useful for self-study, useful for planning, useful for achieving and generally useful); and (Indicator 4 [Assessment]—useful for self-study and generally useful) as specified by the evaluation metric described in the analysis section. These data would indicate that the participants found the indicators to be a useful document for developing a groundwork for web accessibility. Table 5.5 shows the rating means by indicator for all three target groups.

Table 5.5

Usefulness of the Individual Indicators: Rating Means by Job Type—Scale 1 (low) to 7 (high)

	This indicator would be an effective measure as part of a <u>self-study</u> tool for an institution				This indicator would be useful in <u>planning</u> for system-wide web accessibility			
	Indicator #				Indicator #			
	1 Leadership & Commitment	2 Planning & Implementation	3 Resources & Support	4 Assessment	1 Leadership & Commitment	2 Planning & Implementation	3 Resources & Support	4 Assessment
Administrators	5.52* s=1.288	5.77 s=1.230	5.57** s=1.223	5.84 s=1.098	6.03 s=.948	5.90 s=1.136	5.71* s=1.101	5.52 s=1.288
Faculty	6.136 s=1.05	6.03 s=1.177	6.34 s=1.96	6.03 s=1.121	6.31 s=1.061	6.12 s=1.238	6.25 s=1.218	5.84 s=1.194
Technology specialists	6.31 s=.965	6.03 s=1.150	6.36 s=1.055	6.28 s=.991	6.13 s=1.100	6.03 s=1.237	6.18 s=1.103	5.91 s=1.234
Overall	5.99 s=1.150	5.95 s=1.179	6.11 s=1.171	6.05 s=1.076	6.16 s=1.035	6.02 s=1.196	6.05 s=1.155	5.76 s=1.238
	This indicator would be useful to <u>accomplish</u> system-wide web accessibility				I think this indicator is <u>generally</u> useful			
Administrators	5.74 s=1.032	5.83 s=1.177	5.93 s=1.172	5.67 s=1.295	5.90 s=1.012	5.90 s=1.193	5.86 s=1.246	5.80 s=1.270
Faculty	6.03 s=1.092	6.19 s=1.091	6.25 s=1.191	5.91 s=1.201	6.25 s=.916	6.13 s=1.088	6.45 s=1.091	5.90 s=1.274
Technology specialists	6.00 s=1.244	5.81 s=1.378	6.15 s=1.253	5.91 s=1.234	6.22 s=1.039	6.00 s=1.317	6.29 s=1.010	6.10 s=1.136
Overall	5.93 s=1.123	5.95 s=1.221	6.12 s=1.202	5.83 s=1.235	6.13 s=.992	6.01 s=1.193	6.21 s=1.160	5.93 s=1.221

* $p < .05$.

** $p < .01$.

Overall Consumer Satisfaction with Indicators

Participants were asked to rate their satisfaction with each of the 4 indicators on a scale of 1 (low) to 7 (high). They were also asked to rate their satisfaction with the visual layout, the organization and structure of the information, the content, and their overall satisfaction. Scores ranged from a low of 5.35 (visual layout) to a high of 5.99 (Indicator 3 [Resources and Support]). The results across all indicators and aspects can be said to be “good” as specified by the evaluation metric described in the analysis section—over 75% of participants’ ratings were a 5 or above for Indicator 1 [Institutional Vision and Leadership Commitment]; Indicator 2 [Planning and Implementation] and Indicator 4 [Assessment] and can be said to be “very good” with at least 75% of the participants’ ratings a 6 or above for Indicator 3 [Resources and Support]. Additionally, the results for all four aspects met the criteria to be considered “good” (visual layout; the organization and structure of the information; the content; and overall satisfaction). Tables 5.6 and 5.7 show the rating means by indicator for all three target groups.

Overall Results

During data analysis a repeating trend emerged. In most cases, administrators rated the document lower than either the faculty or technology specialists—in some cases, to a statistically significant amount. However, across the board, the ratings for the document remained relatively high (mid 5s to low 6s). These results would indicate that while administrators were slightly more critical of the document, their rating means are still good. Figures 5.4 and 5.5 show the percentage of participants who said that they

Table 5.6

Satisfaction with Individual Indicators: Rating Means by Job Type—Scale 1 (low) to 7 (high)

Job type	Indicator #			
	1 Leadership & Commitment	2 Planning & Implementation	3 Resources & Support	4 Assessment
Administrators	5.42 s = 1.025	5.64 s = 1.129	5.58 s = 1.362	5.60 s = 1.102
Faculty	6.00 s = .910	5.87 s = 1.231	6.10 s = 1.248	5.61 s = 1.498
Technology specialists	5.87 s = 1.238	5.77 s = 1.046	6.23 s = 1.146	6.03 s = 1.110
Overall	5.76 s = 1.087	5.76 s = 1.252	5.99 s = 1.264	5.75 s = 1.255

Table 5.7

Overall Satisfaction: Rating Means by Different Aspects of the Indicators—Scale 1 (low) to 7 (high)

Job type	Satisfaction with the Visual Presentation / Layout of the Indicator Document	Satisfaction with the Structural Organization of the Indicators (e.g., three tiers or levels of information)	Satisfaction with the Content of the Indicator Document	Overall satisfaction with the Indicator Document
Administrators	5.26 s = 1.505	5.74 s = .965	5.29 s = 1.160	5.45 s = 1.091
Faculty	5.52 s = 1.228	5.73 s = 1.281	5.61 s = 1.298	5.58 s = 1.226
Technology specialists	5.27 s = 1.526	5.58 s = 1.347	5.55 s = 1.563	5.64 s = 1.295
Overall	5.35 s = 1.415	5.68 s = 1.204	5.48 s = 1.347	5.56 s = 1.199

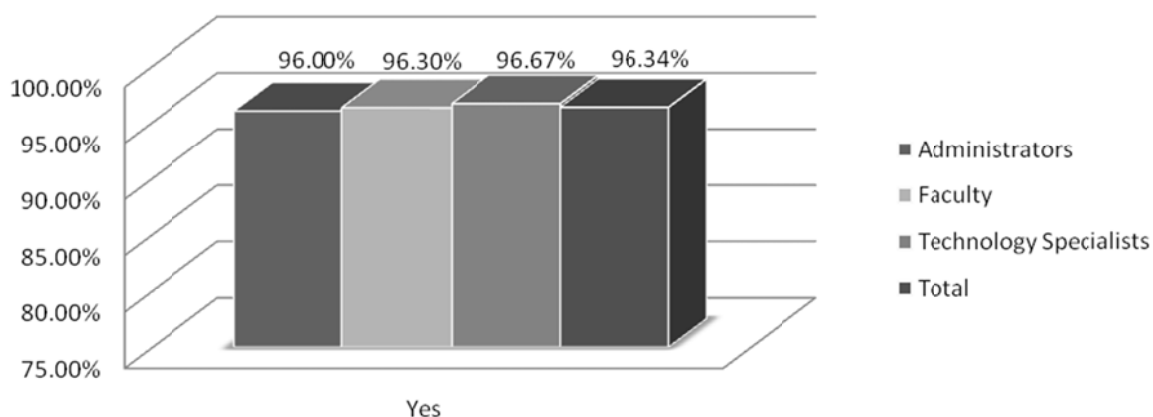


Figure 5.3. Percentage of participants who would use the indicators by job type.

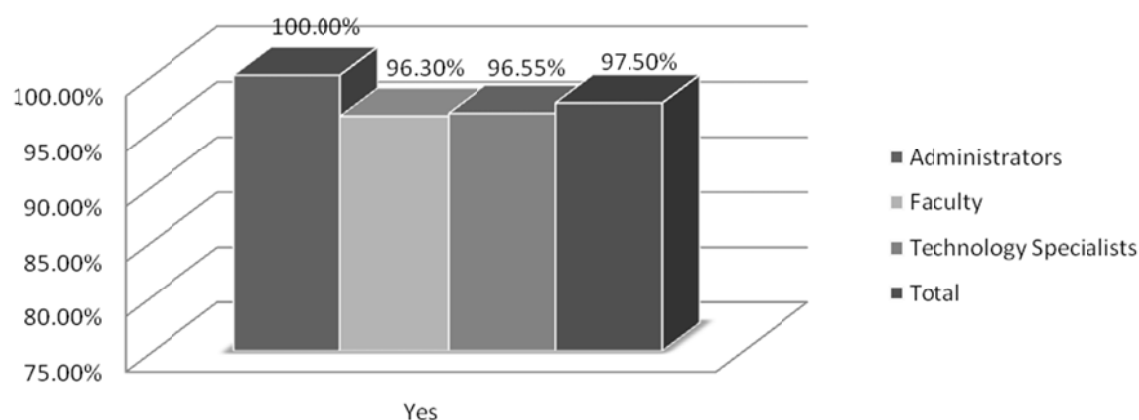


Figure 5.4. Percentage of participants who would recommend the indicators by job type.

would use and recommend the indicators. (Note: these graphs have been truncated to show only the 75%-100% range in order to better show the differences between groups.) When asked if they would use the material and recommend them to others, the responses were positive. Interestingly, while administrators were less likely to use the indicators themselves, they were more likely to recommend them to someone else. While we can only theorize why this might be the result, one possible explanation is that administrators do not consider web accessibility as a task within their direct purview. Instead, they may

prefer to relegate the issue to others at their institution such as personnel from Disability Resources Office or the campus Technology Department.

Participants' Familiarity and Attitude on Web Accessibility

An additional area of interest for the researchers was the influence that knowledge and attitudes about web accessibility had on the participant's evaluation of the indicator document. Participants were asked to rate their familiarity with web accessibility on a scale of 1(low) to 7(high). Figure 5.5 shows the rating means for familiarity with web accessibility by job type.

As one may expect, technology specialists rated their knowledge about web accessibility higher than that of the administrators or faculty. However their mean rating of 5.48 may suggest that while most tech people are familiar with web accessibility, they may not be actively engaged in implementing it. This theory is borne out by a 2006 assessment of web accessibility in Oregon Community Colleges which found that

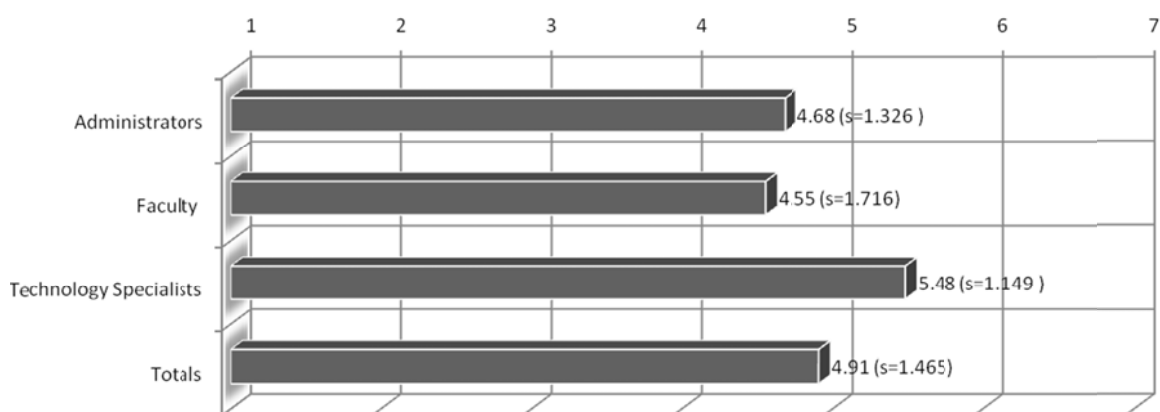


Figure 5.5. Familiarity with web accessibility: Rating means by job type—Scale 1 (low) to 7 (high).

disability services and Information Technology were not integrated, making it difficult to develop a comprehensive accessibility plan (Wisdom et al., 2006).

Participants were also asked to rate the importance of web accessibility to themselves and their institution on a scale of 1(low) to 7(high). Figure 5.6 shows the rating means of importance of web accessibility to the participant as well as how the participant views its importance to their institution.

Administrators and faculty rated the importance of web accessibility higher than technology specialists and all three groups indicated that it was more important to them personally than it was to their institutions. This result is particularly telling when looking at the technology specialists' ratings; while they rate themselves as having the greatest understanding of the topic, they rated it as less important to them than other participant groups. They also rated it as less important to their institution. This situation highlights the importance of administrative leadership to ensure an accessible web presence. If web accessibility is not important to the leaders of an institution, or if the importance of the issue is not communicated through the ranks, web developers and other staff may be

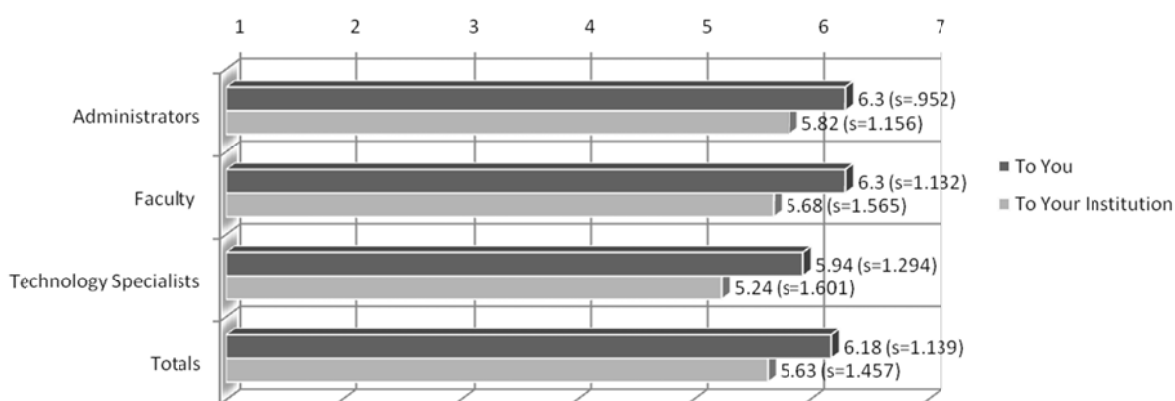


Figure 5.6. Importance of web accessibility to self and institution: Rating means by job type—Scale 1 (low) to 7 (high).

unlikely to take on the additional work necessary. This communication may also help to improve attitudes toward web accessibility as studies that have found that exposure to complex concepts or technology does have a positive effect on the user's predisposition to it (Bill, 2003).

Can You Teach an Old Academic New Tricks?

A final demographic response, the length of time the participant had been in their position (or one similar), showed consistent differences in the participants' opinion of the indicators. When grouped by the range of years they had been in their position [0-5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, and 26-40 years] the rating means for participants tended to be higher for the groups who had been in their positions the shortest amount of time then drop for the groups who had been in their positions longer. The trend tended to rebound with the group who had been in their positions longest (26-40 years) rating the document higher than those in the middle ranges.

Analysis showed the trend described above to be statistically significant for Indicator 1 [Leadership and Commitment]—useful for self-study ($p = .035$); Indicator 2 [Planning and Implementation]—understandability ($p = .008$), useful for self-study ($p = .032$), useful for planning ($p = .014$), usefulness aggregated ($p = .026$), and satisfaction ($p = .013$); Indicator 3 [Resources and Support]—understandability ($p = .036$), useful for self-study ($p = .002$), useful for planning ($p = .02$), useful for accomplishing ($p = .025$), generally useful ($p = .017$) and usefulness aggregated ($p = .003$); and Indicator 4 [Assessment]—useful for self-study ($p = .028$), useful for planning ($p = .028$), useful for

accomplishing ($p = .028$), generally useful ($p = .032$) and usefulness aggregated ($p = .038$). An aggregate across all four indicators and all dimensions (self-study, planning, accomplishing, and generally useful) also showed significant differences in the pattern described above ($p = .009$) as did aggregates across all four indicators for usefulness for self-study ($p = .009$), usefulness for planning ($p = .016$) and general usefulness ($p = .008$).

When asked if they would use or recommend the indicators, those who had been 16-20 years in their position were the most likely to respond in the negative. This response may be indicative of a possible wariness for dealing with new job demands—a kind of professional inertia. Figures 5.7 and 5.8 show the percentage of participants who would use and recommend the indicators by the number of years in their position. (Note: these graphs have been truncated to show only the 75%- 100% range in order to better show the differences between groups.)

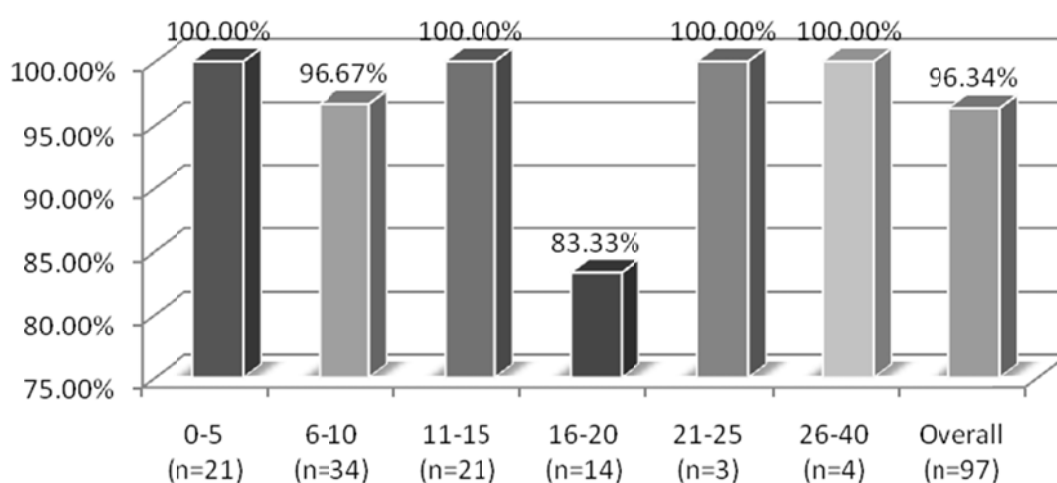


Figure 5.7. Percentage of participants who would use the indicators by years in job.

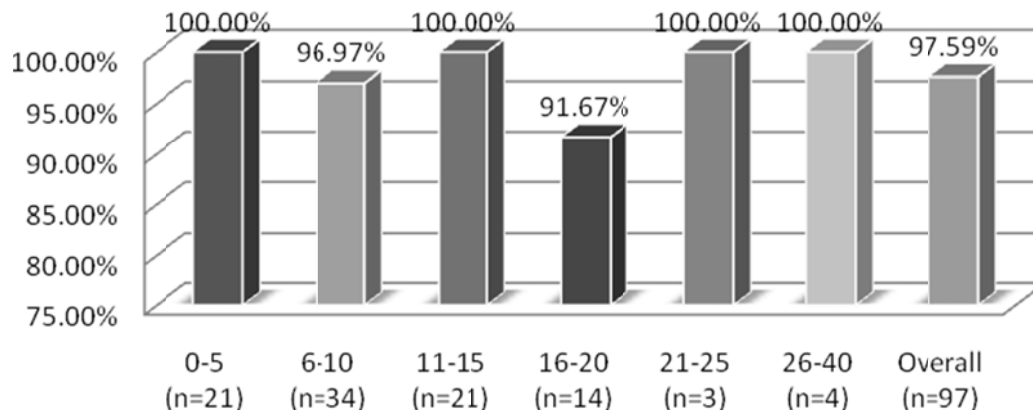


Figure 5.8. Percentage of participants who would recommend the indicators by years in job.

If one hypothesizes that the length of time in a position is indicative of the age of the participants, the number of years in position and ratings of the indicators may echo similar findings in a number of studies which looked at age as a factor in attitude and adoption of technology (Bill, 2003; McFarland, 2001; Morris, 2005). However, this theory does not account for the general rise in ratings of participants who had been in their job at the highest end of the scale. We can only speculate on the reasons for this result. Given that the number of participants in the over 20 year range was very small ($n = 7$), it may be that those at this level of experience chose to participate in the survey because of their existing interest in web accessibility issues and were therefore already amenable to materials that they believe would assist with its improvement. This hypothesis is consistent with the participants' ratings of importance of web accessibility by the time in their position (Figure 5.9).

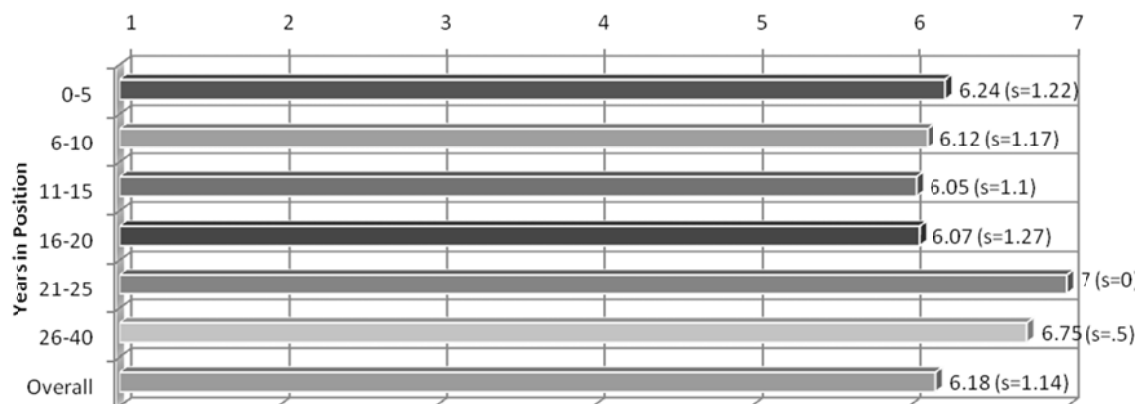


Figure 5.9. Importance of web accessibility to participants by time in job—scale 1 (low) to 7 (high).

Conclusion

Web accessibility is a critical issue facing higher education today. The increasing reliance on technology for all aspects of postsecondary life makes it essential that students, faculty and staff be able to access and use all aspects of an institution's web presence. While there are a number of technical resources available, there are few resources that administrators can use to help plot a course toward a fully inclusive web presence. The results of this study indicate that the institutional indicators developed by Project GOALS are appropriate as a framework for institution-wide web accessibility. By using these tools, administrators and advocates can lead their institutions into the 21st century by creating a revolution in online inclusiveness.

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CHAPTER 6

SUMMARY

Results Not Yet Discussed

This section will highlight some points of interest that are not covered elsewhere, including an interview with Dr. Lynn Priddy, the Vice President of the Higher Learning Commission (HLC) regarding the indicator document and an update on the status of project GOALS.

An additional population of interest to Project GOALS was the accreditation community. However, at the time of this study, a conflict between the accrediting bodies and the US government (Lederman, 2008) made approaching the accreditation community directly unfeasible. Nevertheless, I conducted a structured telephone interview with Lynn Priddy, the vice president of the Higher Learning Commission (HLC) using the questionnaire as a script. In her interview, she was very positive about the indicator document, rating all aspects (appropriateness, understandability, usefulness and satisfaction) a 6 or 7 (on a scale of 1 = low to 7 = high). The one exception was the visual presentation/layout of the indicators which she rated at 4. Her lower rating was in line with the results from the main participants of the survey who rated this aspect the lowest with an average score of 5.35. Based on the comments by Dr. Priddy and the other participants, the indicator document has been completely redesigned. One other suggestion that she made was to edit the detail on the benchmark on procurement as it was far more detailed than the rest of the document—this suggestion was adopted in the

subsequent version of the indicators. Overall, however, Dr. Priddy was extremely positive and complimentary of the indicator document stating that it was well thought-out and balanced.

While not directly related to this study, the quality of the GOALS products was an important factor in the award of a new 2010 FIPSE grant. GOALS staff will work with regional accreditation agencies to develop a blueprint and customized materials and processes that can assist in the adoption of enterprise-wide web accessibility. This award is particularly noteworthy as it represents a significant sea change in position from the time of the original 2007 grant and my 2009 study. The accreditors who were once wary of our cause are now partners in our efforts.

Conclusion

The results of this study suggest that the Institutional Indicators of Web Accessibility developed by Project GOALS are suitable as a resource for institutions that wish to plan for or improve system-wide web accessibility. Based on the criteria described in the Methods section, all aspects of the indicator document can be said to be either “good” or “very good” indicating that the document is appropriate, understandable, usable and satisfactory for their purpose of providing a framework for creating an accessible web presence.

This section outlines the changes to the indicator document based on the results of this study, discusses its delimitations, and provides recommendations for future studies. From a more personal perspective, I also highlighted some lessons learned from my

research experience and discuss the multiple-paper format and the status of the papers themselves.

Changes to the Indicator Document

Substantial changes were made to the indicator document based on the results of the study. Visual presentation received the lowest rating mean of any question on the survey (5.35 on a scale of 1-7). Participants commented that the background images and styling made it distracting and difficult to read. As a result, the layout and design has been completely revised to a much cleaner and streamlined look. A draft of the indicator document used for this study is available in Appendix 2 (see Institutional Indicators).

Additionally, comments from the participants indicated that some of the language and terms used throughout the indicator document were confusing and hard to understand (e.g., “stakeholder groups” and “key personnel”). These results were confirmed by a project-based usability test. Based on this feedback, the GOALS team revised the text, defined confusing terms and removed “jargon” language from both the indicator document and the tool. Another common request was for additional information and examples. While this level of detail was beyond the scope of the indicator document, these requests were incorporated into the GOALS Tool.

Delimitations of This Study

The overall participant response to the indicator document was quite positive. However, it should be noted that the results of this study may not be generalizable to a

broader population. The study used a volunteer sample as participants. Because of this self-selection, it is possible, even probable, that the participants chose to participate due to an existing interest in web accessibility. It may also be that the participants were responding to the indicators as a tool for advocacy rather than the specifics of the indicators themselves.

It is also possible that the participants were influenced by the social desirability phenomenon, a common phenomenon where participants have a tendency to over-report socially acceptable or desirable attitudes and behaviors (Sierles, 2003). Given the nature of the issue, participants may have felt that lower ratings would translate to a perceived lack of concern for disability issues. Furthermore, while the instructions for the study did urge the participants to freely share their opinions, many people tend to rate things more positively than their actual estimations of a product (Peterson & Wilson, 1992). This positivity bias may also have been a factor in the affirmative ratings.

Recommendations for Additional Research

The results of the study indicate that those from 2-year institutions rated the Indicators higher than their peers from 4-year institutions. However, the number of participants from two-year institutions ($n = 14$) was considerably lower than the number of participants from four-year institutions ($n = 79$). While the use of parametric analyses did adjust for this disparity, future studies which focus on web accessibility in higher education may wish to recruit a more balanced sample. A focus on 2-year schools may be especially relevant as students with disabilities attend 2-year schools at a greater rate than

four-year institutions (US GAO, 2009).

Additionally, the study found differences in the rating means of the document based on the number of years the participants' had been in their positions. Additional research is needed to determine if factors such as age and tenure influence this trend.

The study also found that the administrators' mean ratings tended to be lower than their faculty or technology specialist counterparts. This may be in part due to the emphasis on administrative leadership and support throughout the indicator document. In order to be effective, system-wide web accessibility requires the necessary resources and mandates from the top. Therefore, it is essential to get administrators on board. Research into ways to encourage administrative buy in—including a look at pain points and motivators would be advised.

This study did not include a student population. However, students are important stakeholders in the development and maintenance of an accessible web presence. As such, including students in future studies and discussions is highly recommended.

Furthermore, given the issues inherent with a volunteer sample as discussed in the delimitations section, future evaluations should attempt to recruit a more general audience.

Finally, the web accessibility landscape is changing at lightning speed. Evolving government regulations as well as increasing litigation is bringing the issue to a head. Ongoing monitoring and assessment of the accessibility climate is critical for those who wish to engage in web accessibility studies. This recommendation should also be extended to anyone who is involved in, or responsible for, any aspect of an institutional

web presence.

Lessons Learned

Online surveys can be an effective research tool. However, care must be employed to ensure that the tool works as expected. For example, my exploratory study using the LimeSurvey survey tool showed that the tool was not initially accessible for persons with disabilities. Had this glitch not been discovered until the survey went live, it would have been extremely embarrassing to the project and possibly even hypocritical considering the content of the Indicators. Luckily, this problem was found and fixed. Another issue which was not discovered until after the data had been collected, was that the open-ended text forms limited the amount of text that the field would record. As a consequence when the participant provided particularly long answers, we lost some of their response which may have ultimately affected our interpretation of their comments. The responses which were truncated represent a potential alteration of meaning and are a tangible loss to the richness of the results.

Multiple-Paper Format

The three papers contained within this dissertation have not yet been submitted to the intended publications. The concept of the multiple-paper dissertation is still in a development stage. Thus, there was a great deal of confusion and conflicting information as to whether the papers should be written to the standard of the university or to the requirements of the intended journal. I decided to error on the side of thoroughness. As such, the articles in their current state are far more detailed and much too long for their

eventual audiences. All three will be edited down and submitted to their respective publications once this dissertation has been finalized. For others who choose the multiple-paper format, I would strongly advise including the standard you will be following in your proposal to avoid confusion later on.

One of the most critical factors of the three-paper format for me was ensuring that all three papers were unique yet created a complementary whole. Plotting the scope and focus of each article while still in the proposal stage ensured that while some data are reported across multiple papers, each article offers its own distinctive message. The use of the matrices in Appendix 3 were very helpful to keep me on course.

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APPENDICES

Appendix 1
Questionnaire

Information

This questionnaire is intended to help us evaluate and improve a set of Institutional Indicators developed by Project GOALS (Gaining Online Accessible Learning through Self-Study) as a tool to assist postsecondary institutions in implementing and improving web accessibility through a process of self-study.

We appreciate your willingness to assist us with this project. Your input is greatly valued and all comments and suggestions are welcome. Participation in this study should take approximately ??? minutes (??? to review the indicators and ??? to complete the questionnaire).

Should wish, you are free to discontinue participation at any time without consequence.

If you have any questions or concerns, please feel free to contact me at any time:

Heather Mariger

Phone: 435-797-3656

Email: heatherm@cpd2.usu.edu

Again, thank you for your assistance with this study.

Instructions

Thank you for your help...

Please review the Institutional Indicators document that is linked as a PDF on this page. The document is in [Adobe PDF](#) format. If you have any problems opening or accessing the document, please contact me (see contact information above) and I will be pleased to assist you. Review of the document should take approximately 40-60 minutes. ***Please use this version of the document to answer questions regarding the visual presentation and layout of the indicators.***

The document contains four top level indicators. You will be asked to provide your opinions regarding each one. When responding to these questions ***please base your responses in the context of the complete indicator section, including the benchmarks and evidence associated with that particular indicator.***

Once you have reviewed the Indicator document, please fill out the following questionnaire. This questionnaire has been developed to make it as easy to use as possible. The questionnaire contains seven sections, most questions requiring only a click to answer. It should take approximately 30-40 minutes to complete. However, you will be able to leave the questionnaire and return later to complete it should you wish. Once you have finished the questionnaire, click the submit button at the end of the survey.

At the end of the questions regarding each indicator, we have also included the ability to rate and comment on the benchmarks and evidence associated with that indicator. ***Use of this feature is purely voluntary*** and you may use it to comment on as many or as few sections as you please. We welcome any thoughts or suggestions that you have.

Please remember, we want your frank and honest opinion regarding these materials. Your feedback, even if it is not flattering, will help us to improve this document and all materials that will be built upon its foundation

[Take the survey](#)

Download the Indicators (pdf file)

Demographic Information

What is your primary assignment in postsecondary education? (*check one*)

Administrator

Faculty / Instructor

Technology Specialist / Web Designer / Developer

How long (in years) have you worked in this type of position? _____ Years

What Type of Institution? (*check one*)

Two-Year

Four-Year

Other: (Please specify) _____

Have you ever been involved in a web planning or web standards work group? (*check one*)

Yes— Did the web planning or standards group address web accessibility for individuals with disabilities?

No—

Have you ever been involved in an institutional self-study for accreditation or other purposes? (*check one*)

Yes— Did the self-study include a component that addressed web accessibility for individuals with disabilities (i.e., students, faculty, staff)? (Y/N)

No—

About Web Accessibility

How familiar are you with web accessibility?	Not at all familiar 1 2 3 4 5 6 7 Extremely Familiar
Rate the importance of web accessibility <i>to your institution</i>	Not at all important 1 2 3 4 5 6 7 Extremely Important

What factors do you believe influence your institution's attitudes regarding web accessibility?

<i>Positively</i>	<i>Negatively</i>
-------------------	-------------------

Rate the importance of web accessibility <i>to you</i>:	Not at all important 1 2 3 4 5 6 7 Extremely Important
--	--

What factors influence your attitude regarding web accessibility?

<i>Positively</i>	<i>Negatively</i>
-------------------	-------------------

Indicator #1: Institutional Commitment

Commitment across the organization is essential for system-wide web accessibility. Administrators and personnel at many levels must actively support, participate and take ownership in an established accessibility plan.

Reminder: Please base your responses to the following questions in the context of the complete indicator—including the benchmarks and evidence associated with that particular indicator:

Appropriateness

How appropriate is this indicator as part of a framework for considering web accessibility at your institution?	Not at all Appropriate 1	2	3	4	5	Extremely Appropriate 6	7
How appropriate is this indicator as part of a framework for considering web accessibility at another institution?	Not at all Appropriate 1	2	3	4	5	Extremely Appropriate 6	7

What would make this indicator more appropriate as part of a framework for web accessibility at **your** institution?

Understandability

How understandable is this indicator?	Not at all Understandable 1	2	3	4	5	Extremely Understandable 6	7
---------------------------------------	--------------------------------	---	---	---	---	-------------------------------	---

What was easy to understand?

What was difficult to understand?

Usefulness

This indicator would be an effective measure as part of a self-study tool for an institution	Completely Disagree				Completely Agree		
	1	2	3	4	5	6	7
This indicator would be useful in planning for system-wide web accessibility	1	2	3	4	5	6	7
This indicator would be useful to accomplish system-wide web accessibility	1	2	3	4	5	6	7
I think this indicator is generally useful	1	2	3	4	5	6	7

Comments:

Satisfaction

What is your overall opinion of this indicator?	Not at all satisfied				Extremely Satisfied		
	1	2	3	4	5	6	7
<i>Comments:</i>							

Comments on the benchmarks and evidence are not mandatory; however, we welcome your thoughts and suggestions:

Click yes on any benchmarks you wish to comment on and they will be available when you click “next”

Benchmark A: Commitment of Administrative Leadership

Administrative leadership begins when there is a vision and commitment toward change. Typically this vision, and its leadership support, stems from efforts made at top administrative levels. Over time the leadership commitment results in development and enforcement of an accessibility policy and plan and the necessary resources to implement them.

Would you like to comment on this benchmark?

Benchmark B: Relevant Stakeholder Participation

Faculty, staff, and students involved in the development, maintenance or use of institutional web content are each part of the accessibility outcomes for their institution. Stakeholder knowledge and ownership of their role is important, as each will likely take a slightly different role. Examples of this participation include that faculty assure their online course materials are accessible; that technical staff develop accessible websites; that a staff assistant develop documents accessibly if they are to be linked from the web; that procurement staff assure purchases meet institutional accessibility standards; and that students provide appropriate feedback on actual accessibility.

Would you like to comment on this benchmark?

Web accessibility does not happen without careful planning. Policies and procedures are established and a systematic plan for accessibility developed, instituted, and carried out across the organization.

Appropriateness

*What would make this indicator more appropriate as part of a framework for web accessibility at **your** institution?*

What was easy to understand?

This indicator would be an effective measure as part of a self-study tool for an institution	Completely Disagree			Agree		Completely	
	1	2	3	4	5	6	7
	This indicator would be useful in <i>planning for</i> system-wide web accessibility	1	2	3	4	5	6
This indicator would be useful to <i>accomplish</i> system-wide web accessibility	1	2	3	4	5	6	7
I think this indicator is generally useful	1	2	3	4	5	6	7
<i>Comments:</i>							

Satisfaction

What is your overall opinion of this indicator?	Not at all satisfied			Extremely Satisfied			
	1	2	3	4	5	6	7
Comments:							

Comments on the benchmarks and evidence are not mandatory; however, we welcome your thoughts and suggestions:

Click yes on any benchmarks you wish to comment on and they will be available when you click “next”

Benchmark A: Inclusion of Key Personnel

Incorporating key personnel is essential throughout the entire process of planning and implementation. Key personnel (e.g., advocates, advisors, technical staff, faculty leaders and staff) are identified and included as the institution moves from planning to implementation to maintenance of a system-wide accessible web presence.

Would you like to comment on this benchmark?

Benchmark B: Comprehensive Accessibility Policy

A stated policy that provides specific guidelines and standards for web accessibility is necessary in order to ensure that all administration and stakeholders understand what is required of them. Once established, the policy should be promoted and enforced.

Would you like to comment on this benchmark?

Benchmark C: Comprehensive Written Accessibility Plan

An institution-wide effort requires a systematic plan of action. This plan includes strategies for all aspects of implementation, including: goals, timelines, budgeting, equipment, personnel, ongoing assessment and, when necessary, adaptation of the plan.

Would you like to comment on this benchmark?

Benchmark D: Implementation of the Written Plan

Once the accessibility policy and plan are in place, administration and others must put that plan into action. Ongoing assessment and monitoring of progress is used to ensure the plan is on track. Attention is also paid to changes in technology and trends which may disrupt the plan or change the requirements of accessibility.

Would you like to comment on this benchmark?

A system-wide web accessibility plan requires adequate resources and support. The institution must provide the resources necessary to implement the accessibility plan as well as consider provisions to ensure that the system is sustainable and will remain accessible.

Reminder: Please base your responses to the following questions in the context of the complete indicator—including the benchmarks and evidence associated with that particular indicator:

How appropriate is this indicator as part of a framework for considering web accessibility at <i>your</i> institution?	Not at all	Appropriate					Extremely Appropriate
	1	2	3	4	5	6	7
How appropriate is this indicator as part of a framework for considering web accessibility at <i>another</i> institution?	Not at all	Appropriate					Extremely Appropriate
	1	2	3	4	5	6	7

Understandability

How understandable is this indicator?	<div> <div>Not at all Understandable</div> <div>Extremely Understandable</div> </div> <div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> </div>						
--	---	--	--	--	--	--	--

What was difficult to understand?

This indicator would be an effective measure as part of a self-study tool for an institution	Completely Disagree				Completely Agree		
	1	2	3	4	5	6	7
This indicator would be useful in <i>planning for</i> system-wide web accessibility	1	2	3	4	5	6	7
This indicator would be useful to <i>accomplish</i> system-wide web accessibility	1	2	3	4	5	6	7
I think this indicator is generally useful	1	2	3	4	5	6	7
<i>Comments:</i>							

Satisfaction

What is your overall opinion of this indicator?	Not at all satisfied				Extremely Satisfied		
	1	2	3	4	5	6	7
<i>Comments:</i>							

Comments on the benchmarks and evidence are not mandatory; however, we welcome your thoughts and suggestions:

Click yes on any benchmarks you wish to comment on and they will be available when you click “next”

Benchmark A: Sufficient Time and Effort Allocated to Personnel

The process of conversion into an accessible web presence takes time. Both the time and effort required are identified when allocating faculty and staff responsibilities.

Would you like to comment on this benchmark?

Benchmark B: Focus on Personnel

The best plan in the world is worthless without the personnel to implement it. Finding and retaining key accessibility personnel is essential. Staff and faculty often have a great number of responsibilities that require their time and attention. Therefore it is important to provide motivation or incentives to ensure that the plan is given the necessary attention.

Would you like to comment on this benchmark?

Benchmark C: Budget Sufficient to Meet Stated Plan

Financial requirements are taken into account when developing the accessibility plan and budgeted for accordingly. Necessary materials, licenses and equipment, personnel, and training are considered. Ensuring that the funding necessary for sustaining the system once developed is also factored into the budget.

Would you like to comment on this benchmark?

Benchmark D: Training and Technical Support

The expertise and materials necessary to ensure that personnel are able fulfill their parts of the accessibility plan must be made available.

Would you like to comment on this benchmark?

Benchmark E: Procurement, Development, and Use of Technologies That Will Result in Accessible Web Content

To create and maintain accessible web architecture, the tools used by the institution must render content that is accessible. Failure to procure, or develop, accessible technologies will perpetuate the need to fix the problems introduced by others. A strong procurement policy, with language added into contracts, will assure that the institution is using its resources wisely and purchasing goods and services that are in line with institutional efforts. This includes the acquisition of programs and resources such as open source, shareware, and freeware that do not go through the traditional procurement process.

Would you like to comment on this benchmark?

Ongoing assessment is necessary to ensure that an accessibility plan is working and on track. Processes need to be in place to measure progress, consumer satisfaction, and to determine the sustainability of the program.

Appropriateness

*What would make this indicator more appropriate as part of a framework for web accessibility at **your** institution?*

What was easy to understand?

Usefulness

This indicator would be an effective measure as part of a self-study tool for an institution	Completely Disagree				Completely Agree		
	1	2	3	4	5	6	7
This indicator would be useful in <i>planning for</i> system-wide web accessibility	1	2	3	4	5	6	7
This indicator would be useful to <i>accomplish</i> system-wide web accessibility	1	2	3	4	5	6	7
I think this indicator is generally useful	1	2	3	4	5	6	7
Comments:							

Satisfaction

What is your overall opinion of this indicator?	Not at all satisfied				Extremely Satisfied		
	1	2	3	4	5	6	7
<i>Comments:</i>							

Comments on the benchmarks and evidence are not mandatory; however, we welcome your thoughts and suggestions:—

Click yes on any benchmarks you wish to comment on and they will be available when you click “next”

Benchmark A: Evaluation of Progress on the Implementation Process

Provisions are made to ensure that the plan is implemented as intended (e.g., scope, training and support of staff, timelines). Oversight must be given to key personnel to evaluate progress and ensure that implementation is occurring at predicted levels, or that alterations in planned implementation are identified and communicated.

Would you like to comment on this benchmark?

Benchmark B: Evaluation of Web Accessibility Outcomes

No plan or policy is useful if it does not provide the intended outcome. It is essential that the institution periodically monitors and evaluates their web accessibility to determine if it is meeting the standard set by the institution. As technology and standards change over time, it is also important that the institution determine if the stated outcome is sufficient or if it should be altered to be in line with current standards and practices.

Would you like to comment on this benchmark?

Benchmark C: Assessment Results Are Used To Improve Institutional Accessibility

Data gathered from evaluations of both the process and the outcomes of web accessibility are of no value unless they are used to improve and inform what should happen in the future. Ongoing oversight and review of data sources are used to make changes to procedures to ensure that the institution can create and maintain system-wide web accessibility. Moreover, these same data can be used for future changes in institutional policy

Would you like to comment on this benchmark?

Summary

Satisfaction

Are you satisfied with the Visual Presentation / Layout of the Indicator Document? (<i>the pdf version</i>)	Not at all satisfied				Extremely Satisfied		
	1	2	3	4	5	6	7
Are you satisfied with the Structural Organization of the Indicators (e.g., three tiers or levels of information)?	1	2	3	4	5	6	7
Are you satisfied with the Content of the Indicator Document?	1	2	3	4	5	6	7
What is your overall satisfaction with the Indicator Document?	1	2	3	4	5	6	7

What format do you prefer when reading a document such as this?

I prefer reading an online document
I prefer reading a printed document
I have no preference

Would you use these indicators?

Yes— **Why**
No— **Why Not?**

Would you recommend these indicators to others?

Yes— **Why**
Who would you recommend these materials to?
No— **Why Not?**

How do these indicators compare to other sources of similar information?

Better
About the Same
Worse
Don't Know

What sources would you compare these indicators to?

Did you have any problems with the indicators?

Yes— **What?**
No—

Is there anything that you would add to the indicators?

Yes— **What?**
No—

Is there anything that you would remove from the indicators?

Yes— **What?**
No—

Do you have any other suggestions or comments for improving these indicators?

Yes— **What?**

No—

email Address: _____ *

* All emails will be kept private—they will not be given to anyone or used for any other purpose than to send the indicators and results of the survey.

May we contact you if we have a question regarding your survey?

Yes -

No—

Submit

Thank-you for your help with our research. Your assistance and comments will help us to improve the Institutional Indicators and provide valuable information when developing additional products. A summary of the results of this study will be made available when the data have been analyzed.

For your participation, we would like to offer you and your institution a copy of the finalized indicators and a copy of the results of this study when they are available. The indicators and results will be sent to the email address you have provided.

If you have any additional comments, concerns, or would like to discuss this survey or the indicators, please do not hesitate to contact me:

Project GOALS

Heather Mariger

Phone: 435-797-3656

Email: heatherm@cpd2.usu.edu

Website: <http://ncdae.org/goals/>

Again, thank-you for your time and valuable contribution to this study.

Appendix 2

Copyright Permission Letter and Institutional Indicators

April 21, 2011

Heather Mariger
6818 Old Main Hill
Logan, UT 84321

Dear Heather:

As the Project Director for Project GOALS (Gaining Online Accessible Learning Through Self-study), I am pleased to grant Heather Mariger permission to include a copy of Project GOALS' "Recommended Practice Indicators for Institutional Web Accessibility" Document as part of her dissertation publication.

It should be noted that the version to be published in the dissertation document is a draft version which was used as the basis for Heather's social validation study. Through this study, changes and revisions have been made to the document. You may view the final version of the Indicator Document online at: <http://ncdae.org/goals/indicators.php>.

Sincerely,

Cyndi Rowland



Gaining
Online
Accessible
Learning
through
Self-study

Institutional Indicators

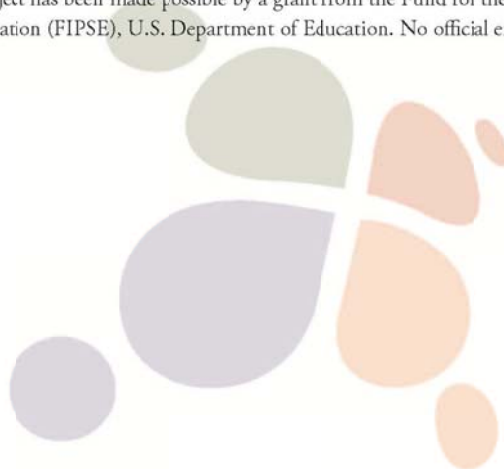
A step-by-step process for gaining system-wide accessibility in postsecondary settings.

Tel: (435) 797-3381
Email: goals@ncdae.org
www.ncdae.org/goals

UtahStateUniversity
CENTER FOR PERSONS WITH DISABILITIES

Acknowledgements

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 Indicator #1: Institutional Vision and Leadership Commitment	08
Benchmark A: Commitment of Administrative Leadership	08
Evidence of this benchmark may include:	
A statement of vision or commitment	08
The creation and maintenance of an accessibility task force or institution-wide accessibility group	09
The creation of an institutional policy on web accessibility	09
The creation of an enterprise-wide accessibility action plan	09
Resources are available for web accessibility efforts	09
Visibility, promotion, and communication of web accessibility efforts	09
Benchmark B: Relevant Stakeholder Participation	10
Evidence of this benchmark may include:	
An array of accessibility stakeholders participate in strategic planning and continuous improvement	10
Personnel engage in professional development that includes or is focused on web accessibility	10
Faculty, staff and students take responsibility for web accessibility outcomes within their purview	11
Systems are present for individuals to provide feedback on the implementation and outcomes of web accessibility	11
 Indicator #2: Planning and Implementation	12
Benchmark A: Inclusion of Key Personnel	12
Evidence of this benchmark may include:	
Involvement of key accessibility personnel and stakeholders in development of the enterprise-wide web accessibility plan	12
Involvement of key accessibility personnel and stakeholders in policy development	12
Involvement of key accessibility personnel and stakeholders in the implementation of enterprise-wide web accessibility	12-13

Benchmark B: Comprehensive Accessibility policy 13

Evidence of a comprehensive policy may include:

A summary statement of policy	13
Effective date(s)	13
The scope of the policy	13
A technical standard	13
A provision for procurement	14
Consequences for non-conformance to the policy	14
Mechanisms for ongoing review	14

Benchmark C: Comprehensive Written Accessibility Plan 14

Evidence of a comprehensive accessibility plan may include:

<i>Business Concept</i>	14
An executive summary or statement of concept of the plan	14-15
<i>Position and Market Analysis</i>	15
A provision for benchmarking and market evaluation	15
A provision to gather baseline information	15
Identification of existing institutional challenges and risks	15
Identification of existing institutional priorities	15
<i>Marketing</i>	15
A process to communicate and market the plan to the campus and other communities	15
<i>Financial</i>	16
A provision for budget items appropriate to accomplish the plan	16
<i>Implementation</i>	16
Metrics, milestones, and measurable steps	16
A Timeline	16
Assignment of specific responsibilities	16
Training plan for staff, faculty and students	16
A plan to obtain and use feedback enterprise-wide	16
A plan to monitor progress of accessibility outcomes	17
Explicit strategy to evaluate and revise the plan in an ongoing way	17

Benchmark D: Implementation of the Written plan 17

Evidence of this benchmark may include:

Meeting minutes of the accessibility team/task force	17
Documentation of baseline information	17
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Best Practice Indicators for Institutional Web Accessibility (Draft)

THE INTERNET can be a tremendous asset for students, faculty, and staff with disabilities, providing a level of independence that was not previously available. Unfortunately, many postsecondary websites are not as accessible as they could be. Some institutions opt for after-the-fact accommodations, but this approach can be time consuming and is often an inefficient use of limited resources. Furthermore, inaccessible websites can compromise educational outcomes for students and hinder employees' ability to efficiently and effectively perform their roles.

In order to ensure that all individuals are able to participate fully in postsecondary settings, the complete institutional web presence needs to be accessible. This requires system-wide effort and support, and in many cases, a plan or "blueprint" to guide the process. This document provides a framework for planning and implementing web accessibility across an organization and draws from best practices in the field today.

The indicators and benchmarks found in this document can be used as an aspect of self-study or as part of a system of continuous-quality improvement. Some institutions may use these materials to develop new, or aid existing, efforts focused solely on web accessibility, while others may use them as part of a broader commitment to accessible IT issues beyond the web. By using this document, institutions can assess their current accessibility standing, improve enterprise-wide web accessibility, and promote an institutional culture to sustain it. It is hoped that this document can also provide a path for evaluators who wish to assess current practices and improvements in web accessibility as part of their institutional processes or ongoing strategic plan.

The structure of this document is intended to assist institutions to link what they do with the many practices that positively affect enterprise-wide web accessibility. Institutional accessibility efforts are determined by the presence of four key institutional indicators, and each indicator is comprised of several benchmarks, which are expressed through a series of actions that define, and show evidence of, that specific benchmark. The strength of institutional evidence for each benchmark can be evaluated by looking at various permanent products and documented processes. The exemplars found in this document are some (but by no means all) of the options for providing evidence for benchmarks. As each institution is unique, this document should be used as a framework to determine the evidence that is appropriate given their individual context.

Indicator #1: Institutional *Vision* and Leadership Commitment

INSTITUTION-WIDE WEB ACCESSIBILITY is best attained, and sustained, when there is leadership to support an enterprise-wide vision and commitment toward accessibility. This support should come from leadership at many levels including an institution's governing board, campus administrators, and key personnel. Each must actively support, participate, and take ownership in the work and outcomes of accessibility.

Benchmark A: Commitment of Administrative Leadership

Administrative leadership begins when there is a vision and commitment toward change. Typically this vision, and its leadership support, stems from efforts made at top administrative levels including the institution's board of governors or trustees. Over time the leadership commitment results in development and enforcement of an accessibility policy and plan and the necessary resources to implement them.

Evidence of this benchmark may include:

A statement of *vision* or commitment

A statement of the system's or institution's vision or commitment to web accessibility is published and made readily available. Those with a vested interest in the institution know the vision and commitment to web accessibility. To the extent feasible, relevant stakeholders are made aware of their responsibilities under this vision. This may take the form of a letter, email, or memo from the responsible source, such as the Board of Regents, or the Office of the President or Chancellor. At times this content is also posted to the web.

• The creation and maintenance of an accessibility task force or institution-wide accessibility group

Institutional leadership is provided to establish an accessibility task force or advisory group. The group is typically charged to oversee changes to the institutional accessibility climate and tasked to develop and enact, or recommend, accessibility initiatives. This group ensures that relevant stakeholders provide input and that multiple perspectives are present in the planning and development of enterprise-wide accessibility efforts.



• The creation of an institutional *policy* on web accessibility

The institution has a published policy on web accessibility. This policy defines the standard to which the institutional web pages will adhere. (Sample components for a comprehensive policy are detailed in indicator #2.) It is anticipated that institution-wide policies such as this also appears in documents across the institution (e.g., employee handbooks, student government guidelines, faculty senate rules). Ideally, institutional web accessibility policy would stem from governing boards (Trustees, Board of Regents) however, when this is not the case, institutions will need to enact local policies.

• The creation of an enterprise-wide accessibility action *plan*

Institutional leadership has an established plan detailing how they will meet their vision for accessibility as stated in their policy. This includes both current and future accessibility efforts. This plan should be directly linked to the strategic goals of an institution. This plan can be stand alone or part of a full business prospectus. (Sample components for an implementation plan are detailed in indicator #2.)

• Resources are available for web accessibility efforts

Members of leadership (i.e., governing boards, institutional leaders) plan for and commit the necessary resources to ensure the success of their action plan. This includes resources of time, money, materials, and personnel.

• Visibility, promotion, and communication of web accessibility efforts

Statements regarding the institution's vision, leadership, and commitment to web accessibility are evident. Ongoing communication about the plan and the administration's dedication to it reinforces its importance and keeps the message from being lost. The target audience includes faculty, staff, students, and the community outside the institution.

Benchmark B: Relevant Stakeholder Participation

Including relevant personnel in the planning, implementation, and maintenance of web accessibility helps gather vital input necessary for success, fosters ownership across stakeholders, and assists in sustaining the goal of an accessible web presence. Faculty, staff, and students are indeed stakeholders as they are involved in the development, maintenance or use of institutional web content. Stakeholder knowledge and ownership of their role is important, as each will likely have different responsibilities in promoting overall accessibility. Stakeholders might include technical staff who design accessible web pages, faculty who identify and upload accessible materials into course management tools, staff who create accessible documents intended for the web, procurement staff who ensure that institutional purchases meet the accessibility standard, and individuals with disabilities who provide feedback on the outcomes. The participation of all these diverse individuals is key to success and is one metric of the vision and commitment of leadership to the end goal of enterprise-wide accessibility.

Evidence of this benchmark may include:

- An array of accessibility stakeholders participate in strategic planning and continuous improvement

In order to ensure that plans are created and sustained with the needs of many different groups in mind, many different stakeholders are asked by those in leadership positions to participate in the development of the plan, to provide feedback, and to be fully involved in its implementation. This can be done at a committee or individual level. Stakeholders that commonly participate in enterprise-wide web accessibility planning include; staff from administrative units, central IT, student services, the disability resource office, representative faculty and staff members, accessibility specialists, and individuals with disabilities. At times individuals from risk management, procurement offices, sponsored programs, human resources, or university council are also invited participants.

- Personnel engage in professional development that includes or is focused on web accessibility



Evidence of institutional vision for sustained accessibility can, in part, be found in systems of training and professional development nurtured by those in leadership. Faculty, staff, and technology specialists are provided with, and take advantage of, the training necessary to fulfill their responsibilities. As technology changes and the role of the personnel change, provision is made to ensure that they maintain the required level of knowledge and skills so they may respond with accessible products.

● Faculty, staff and students take responsibility for web accessibility outcomes within their purview

Stakeholders understand their unique roles and responsibilities with respect to developing and maintaining an accessible web presence and are empowered to fulfill those responsibilities. Those in leadership have created a culture where there are expectations for the fulfillment of these unique responsibilities. This can be documented through role statements, evidence of training, and mechanisms for accessibility feedback from students and staff with disabilities.



● Systems are present for individuals to provide feedback on the implementation and outcomes of web accessibility

Those in leadership sanction the creation of feedback systems so that stakeholders are encouraged to provide opinions on progress and implementation of the accessibility plan. Consumers of the institution's web site have a mechanism to report on the accessibility of institutional web pages that they visit.

Indicator #2: Planning and Implementation

Web accessibility requires strategic planning. Policies and procedures are established and a systematic plan for accessibility is developed, instituted, and carried out across the organization.

Benchmark A: Inclusion of Key Personnel

Identifying and using key personnel is essential throughout the entire process of planning and implementation. Key personnel (e.g., advocates, advisors, technical staff, faculty leaders, and staff) are identified and included as the institution moves from planning to implementation to maintenance of an enterprise-wide accessible web presence. (This benchmark can be differentiated from that found in Indicator 1, as the administrative vision exerted to include a variety of stakeholders is different from the actual participation of key personnel representing different stakeholders throughout the process.)

Evidence of this benchmark may include:

Involvement of key accessibility personnel and stakeholders in development of the enterprise-wide web accessibility *plan*

Key personnel are included in the development of an accessibility plan. Personnel help to promote buy-in and provide valuable insight and information to ensure that all contingencies have been considered.

Involvement of key accessibility personnel and stakeholders in *policy* development

Key personnel are also included in the development of the accessibility policy. Key stakeholders promote buy-in and provide input that can help make the policy understandable and approachable to those who will be expected to conform to it.



Involvement of key accessibility personnel and stakeholders in the implementation of enterprise-wide web accessibility

Key personnel are assigned to oversee and/or implement parts of the plan. They can also act to monitor its progress. Assignments are made to

ensure that the plan is on track and that the work being done conforms to the web accessibility standards mandated in the institutional policy. All efforts are made to help departments and personnel meet the requirements set forth in the policy. It is not uncommon for an institution to identify one individual who will have a significant role, including significant time and effort, to act as the Chair of the institution's web accessibility committee comprised of key personnel. In this model, they report on progress to the committee in regular intervals.



Benchmark B: Comprehensive Accessibility Policy

A stated policy that provides specific guidelines and standards for web accessibility is necessary in order to ensure that everyone understands what is required of them. The web accessibility policy appears in the same set of governing documents as other enterprise-wide policies, rather than as a separate unit. Once established, the institutional policy is promoted and enforced.

Evidence of a comprehensive *policy* includes:

• A summary statement of *policy*

The policy provides a summary that explicitly states the rationale for the policy, expected outcomes, when key steps are to be completed, and how these steps are to be achieved.

• Effective date(s)

The date the policy comes into effect is stated. For institutions with a phased implementation of policy, multiple dates, deadlines, or interim dates for each aspect of the plan may appear.

• The scope of the *policy*

Web content that falls under the scope of this policy is defined and included (e.g., are students' pages included or exempt? Does the policy apply to all content under the institutional domain? What about any institutional content that is not under the main domain?). If the institution exempts legacy pages, they are defined or identified. Any exceptions to the policy, and those who can authorize exceptions, are identified and a process for obtaining exemptions is described.

• A technical standard

A technical standard provides the institutional criterion for accessibility and as such is included in the policy. The stated standard helps staff members understand if their web content is in compliance with the policy of the institution or not.

A provision for procurement

Accessibility will be a determining factor in all purchases and requests for proposals or agreements. Procurement of accessible goods and services, in line with the stated policy, is expressly included in the policy. Accessible goods and services include any contracts for goods or services that will impact the institutional web including: content creation and delivery tools, authoring tools, course or learning management systems, student, financial and administrative tools, course resources that are shared but originate from other institutions, and products developed by the institution.

Consequences for non-conformance to the *policy*

Statements are included that detail consequences when the policy is not followed unless there are other documents that describe consequences for non-conformance to similar institutional policies.

Mechanisms for ongoing review

Changes over time may require that the institution's accessibility policy be periodically reviewed to assess the appropriateness of current measures and make adjustments as necessary. A defined system for review and revision, along with provisions for who is responsible for these decisions is included in the policy.

Benchmark C: Comprehensive Written Accessibility *Plan*

An institution-wide effort requires a systematic plan of action. This plan includes strategies for all aspects of implementation, including: goals, timelines, budgeting, materials, personnel, ongoing assessment and, when necessary, revision of the plan. For institutions that require a business plan, these elements can serve as the basis for a prospectus which includes concept, marketing, position and market analysis, financial planning, and implementation.

Evidence of a comprehensive accessibility *plan* may include:

Business Concept

An executive summary or statement of concept of the *plan*

A summary of the plan is available which provides an overview of the statement of concept that includes potential benefits and market



advantages to the institution (i.e., the business purpose of the plan) key points, dates, stakeholder responsibilities and expected outcomes.

Position and Market Analysis

A provision for benchmarking and market evaluation

Websites of peer institutions and other enterprises are evaluated and reviewed in order to assess where an institution's web accessibility stands in relation to other enterprises. These evaluations are also used to provide exemplars of both good accessibility strategies and accessibility pitfalls to be avoided.

A provision to gather baseline information

A baseline assessment of the accessibility of institutional web content against the technical standard is taken to provide critical data that will be used to evaluate outcomes of implementation and aid in necessary modifications.

Identification of existing institutional challenges and risks

Challenges to implementing web accessibility across the institution are identified. Problems may involve resistance to change by some groups, limited personnel with an understanding of web accessibility, or financial constraints. Identification of potential problems and possible solutions are incorporated into the accessibility plan.

Identification of existing institutional priorities

Web accessibility goals fit into many institutional priorities. Examples include the redesign of the campus web site, training initiatives for faculty and staff, and hiring exceptional employees. Institutional priorities that are a good fit for the work of web accessibility are identified to leverage existing initiatives that can promote successful accessibility implementation.

Marketing

A process to communicate and market the *plan* to the campus and other communities

All relevant stakeholders are informed of the institutional effort and given sufficient information to understand their role in the process. This may be accomplished through orientation meetings, institutional memos, email, or campus-wide newsletters.



Financial

• A provision for budget items appropriate to accomplish the *plan*

An adequate budget is established to support the accessibility plan. Provisions are made for the necessary funding for items such as personnel time and effort, training, materials, and licenses or equipment.

Implementation

• Metrics, milestones, and measurable steps

Implementation goals are expressed in measurable steps. Expectations are made explicit so that key stakeholders better understand what is required for conformance to the plan. A set of benchmarks or metrics help an institution set goals and assist stakeholders in understanding what is expected of them.

• A Timeline

Timelines are set for measurable steps throughout the process. Step-wise checks help stakeholders manage their responsibilities and provide an additional measure of understanding. The timeline is developed so that the target dates are achievable and they work in conjunction with established deadlines for conformance. Periodic assessment of timeline and goals are set to help the plan stay on track.

• Assignment of specific responsibilities

Elements of the plan that are critical are assigned to those individuals with the expertise to carry out specific responsibilities. Sufficient time and resources are allocated for these personnel to accomplish assigned responsibilities.

• Training *plan* for staff, faculty and students

Mechanisms for educating and supporting those who will be part of the change to accessibility are included in the plan. The plan details how individuals will receive the training and support they will need so they may do what is expected of them (e.g., is accessibility embedded into existing training or is a new specialized training created?). Additional and ongoing support is available for those with technical or special responsibilities under the plan.



• A *plan* to obtain and use feedback enterprise-wide

There is a mechanism to gather and use data and feedback from both the consumers of web content (e.g. faculty, staff, and students with disabilities who are using institutional web content) as well as those who are expected to implement the accessibility plan (e.g. staff, faculty, technology staff, procurement officers, human resource staff).

A *plan* to monitor progress of accessibility outcomes

Oversight is included in the accessibility plan. Details (e.g., who, when, what) are specified to monitor accessibility outcomes over time to help the efforts stay on track.

Explicit strategy to evaluate and revise the *plan* in an ongoing way

Once the objectives for web accessibility have been achieved, provisions are made to ensure that the institution maintains (or improves) that level of accessibility. Provisions are also made to address changes in technology and evolving standards and procedures as they happen. These assessments occur at regular intervals and data are used to revise the current plan and address emerging needs.



Benchmark D: Implementation of the Written *Plan*

Once the accessibility policy and plan are in place, administrators and others put that plan into action. Ongoing assessment and monitoring of progress is used to ensure the plan is on track. Attention is also paid to changes in technology and trends that may disrupt the plan or change the requirements of accessibility.

Evidence of this benchmark may include:

Meeting minutes of the accessibility team/task force

Minutes and discussions of the accessibility team or task force serve as a record of the implementation and commitment to progress of the institution to enterprise-wide web accessibility.

Documentation of baseline information

Baseline information can include reports and evaluations on the current status of accessibility of an institution's web pages, personnel's training in and understanding of web accessibility, the accessibility status of equipment and software currently used by the institution, and analyses of enterprise-wide challenges and priorities.

Budget and committed effort for sustained web accessibility

A commitment of resources and personnel effort to plan, implement, and sustain enterprise-wide web accessibility is included in the budget. Specific items include faculty and staff time commitments (e.g., faculty role statements, dedication of staff time and effort), and infrastructure needs (e.g., purchase of software necessary for testing or consultants to aid in training).

Campus communications and marketing of the Accessibility *Plan*

The institutional accessibility plan and information on its progress is disseminated to ensure that those in the campus community know about and understand their responsibilities. Dissemination can be done through a variety of media including emails, newsletters, reports, a dedicated webpage, and even campus radio.

Data on training personnel

Training of all relevant personnel is planned and performed. Training can be implemented in a variety of different ways. Documentation data can include: the dates of training, number of trainings, number of personnel trained, types of trainings, and training evaluations.

Statements and/or reports on implementation progress

Existing records can document and track the progress of the implementation plan. These may include documentation on budget, metrics, milestones, and progress reports.

Documentation on feedback from different levels of implementation

Feedback from both end-users (faculty, students, and staff with disabilities) and the personnel involved in implementation of the accessibility plan are used as resources for assessment and improvement of the plan and enterprise-wide web accessibility outcomes. Methods of feedback collection include surveys, mechanisms for reporting problems within specific web pages, periodic evaluations, and staff reports.

Indications of actions taken for non-conforming content

The accessibility plan is enforced. Appropriate and consistent action is taken for non-conformance as outlined in the policy. Records of assessment and action taken are maintained.

Web accessibility outcome data

Periodic evaluations and checks are made to ensure that the web accessibility outcomes are obtained at expected levels (e.g., per the institutional policy and stated technical standard).



Indicator #3: Resources and Support

An enterprise-wide web accessibility plan requires adequate resources and support. The institution must provide the resources necessary to implement the accessibility plan as well as consider provisions to ensure that the system is sustainable and will remain accessible.

Benchmark A: Sufficient Time and Effort Allocated to Personnel

The process of conversion into an accessible web presence takes time. Both the time and effort required are identified when allocating faculty and staff responsibilities.

Evidence of this benchmark may include:

- Accessibility work is recognized on role statements and is reflected in personnel time and effort

The duties and responsibilities of institutional personnel with regard to web accessibility are a part of their role statements or job descriptions. For some roles, these increased expectations will require additional time and effort to achieve. Therefore, the time necessary to carry out those requirements is included as part of their allocated time and effort.

- Feedback on sufficiency of personnel allocation

Feedback is obtained during both the planning and implementation stages of the web accessibility plan to ensure that personnel resources are considered and adequately allocated. Periodic review of staff and faculty time allocations are performed to ascertain whether the current allocations are appropriate.

Benchmark B: Focus on Personnel

The best plan in the world is worthless without the personnel with expertise to implement it. Finding and retaining key accessibility personnel is essential. Moreover, typical staff and faculty often have a great number of responsibilities that require their time and attention. Therefore, it is important to provide them with motivation or incentives to ensure that the plan is given the necessary attention.

Evidence of this benchmark may include:

- Position announcements that include requirements for accessibility experience or knowledge for web development personnel or others as appropriate

The institution includes the need for accessibility knowledge and skills in the competitive process of new hires. Minimum employment requirements include web accessibility for critical job roles such as web developers or other technical staff. Other job descriptions may include the requirement to participate in the institutional effort of web accessibility.

- Presence of incentives and motivators for participation in accessibility efforts

Incentives are present to help ensure that web accessibility gets the necessary attention from faculty and staff. Incentives can take the form of rewards or recognition (e.g., considering accessibility work to be included in promotion and tenure portfolios; staff recognitions for creation of accessible content), or sanctions if their work does not comply with requirements or is not achieved in a reasonable time with support and assistance.

- Data on retention rates for personnel key to accessibility implementation

Every effort is made to retain key personnel in order to maintain continuity and momentum of the plan. Steps are taken to ensure that essential knowledge or understanding of the plan is not lost in transitions and that the loss of key individuals does not affect the plan's timeline while new personnel are hired or trained. Institutional knowledge of retention data are used to aid in adjustments to the plan and to promote improved retention of key personnel over time.



Benchmark C: Budget Sufficient to Meet Stated *Plan*

Financial requirements are taken into account when developing the accessibility plan and budgeted accordingly. Necessary materials, licenses and equipment, personnel, and training are considered. The funding necessary to sustain accessibility of the system is also factored into the budget.



Evidence of this benchmark may include:

Feedback on sufficiency of budget allocation

Feedback, or reporting on the plan, includes comments on the adequacy of allocations for time and effort to support key accessibility personnel, training and technical assistance, any necessary equipment, licenses, and materials, and the provision for sustainability and ongoing support for web accessibility.

Benchmark D: Training and Technical Support

The knowledge, support, and materials necessary to ensure that personnel are able to fulfill their parts of the accessibility plan are made available.

Evidence of this benchmark may include:

Documentation that training of faculty, staff, and students occurs in conjunction with expected accessibility roles

Personnel (e.g., faculty, staff, and procurement specialists) have the training necessary to achieve their role in web accessibility.

Technical assistance and support is available to, and used by, faculty, staff, and students

Beyond training, provisions are made to aid personnel who may need assistance or advice as they work to perform their responsibilities. Provisions are made to ensure that there are necessary supports for personnel at all levels. This support occurs in various forms, such as professional development via selected conferences, focused technical assistance, consultants, and involvement in communities of practice or discussion forums. Support does not need to be hierarchical: fellow practitioners and peers can be a valuable source of information and ideas.

● Presence of materials necessary to support training, technical assistance, and implementation

Those charged with the duties to provide training and support to personnel are given the necessary materials or their own technical support. Materials can include training and other technical resources, accessibility evaluators, assistive technologies used for testing, or the creation of a technology lab that can be used to test for accessibility. Periodic consultation or leadership training in teaching others principles of web accessibility are employed as necessary.

Benchmark E: Procurement, Development, and Use of Technologies That Will Result in Accessible Web Content

To create and maintain accessible web architecture, the tools used by the institution must render content that is accessible. Failure to procure, or develop, accessible technologies will perpetuate the need to fix accessibility problems introduced by others. A strong procurement policy, with language added into contracts, helps to ensure that the institution is using its resources wisely and purchasing goods and services that are in line with institutional efforts. This includes the acquisition of programs and resources such as open source, shareware, and freeware that do not go through the traditional procurement process.

Evidence of this benchmark may include:

● Accessibility procurement language included in contracts is consistent with the institutional standard

Contracts for goods or services that will impact the institutional web site include a requirement that the vendor conform to the institution's standard for web accessibility. For example: If the institution's technical accessibility standard is Section 508, then a contract to purchase or lease a course management tool, or a fiscal management tool, would require that the vendor guarantee that the product minimally conforms to Section 508 specifications (i.e., the institutional standard). Accessibility procurement

requirements are used as a factor in purchasing decisions, and provisions are in place to evaluate and ensure the vendor's accessibility claims. When accessible products are not available, every attempt is made to purchase that which conforms closest to the institutional standard and require in contract that the vendor improve the product to the accessibility standard over a specified period of time. This is most crucial for those enterprise-wide products that impact large segments of the campus community (e.g., course management, human resource, or fiscal man-



agement systems). Products that greatly impact enterprise-wide web accessibility include the following: *Content creation and delivery tools*: Examples include word processing, presentation software, video streaming, podcasting, wikis, and virtual worlds. *Authoring tools*: Examples include any software program used to develop a web site. *Course or learning management systems*: Examples include systems that house, organize, or deliver courses or learning objects. *Student, financial and administrative tools*: Examples include admissions, registration & enrollment, campus financial, human resource, student financial aid, purchasing, student grading and transcripts.



● Course resources that are shared but originate from other institutions

The web accessibility policies of potential partners are considered when making cooperative agreements across institutions to ensure that shared content conforms to the institutional standard for accessibility

● Products developed by the institution meet the accessibility standard

All web-based products developed by campus personnel, or in conjunction with the institution, meet the standards set forth in the institution's web policy.

Indicator #4: Assessment

Ongoing assessment is necessary to ensure that an accessibility plan is working and on track. Processes must be in place to measure progress and obtain desired outcomes, constituent satisfaction, and to determine the sustainability of the program.

Benchmark A: Evaluation of Progress on the Institutional Implementation

Provisions are made to ensure that the plan is implemented as intended (e.g., scope, training, and support of staff, timelines). Oversight is provided to key personnel to evaluate progress and ensure that implementation is occurring at predicted levels, or that alterations in planned implementation are identified and communicated.

Evidence of this benchmark may include:

Data or information on institutional progress within the implementation process

Data or information that is gathered in the course of developing and implementing campus-wide accessibility is used as a resource for evaluation and improvement of the process.

Formal reports on the progress of the intended implementation *plan*

Formal reports on progress serve as a catalyst for evaluation and review. Information from a variety of sources and viewpoints are brought together in a formal report to provide insight into the enterprise-wide process that may not be apparent when components are reviewed in isolation.

Informal summaries or communications on the progress of the implementation *plan*

Informal information and summaries are used to supply quick and useful information on the progress of the plan. Data is used to provide an early warning of potential problems and to alleviate or resolve them before they become critical.



Benchmark B: Evaluation of Web Accessibility Outcomes

No plan or policy is useful if it does not provide the intended outcome. It is essential that the institution periodically monitors and evaluates the status of its web accessibility to determine if it is meeting the standard set by the institution. It should be noted that automated accessibility tools do not provide a complete assessment picture and manual checks need to be included as part of the evaluation plans. As technology and standards change over time, it is also important that the institution determine if the stated outcome is sufficient or if it should be altered to be in line with current standards and practices.

Evidence of this benchmark may include:

Institutional web accessibility data

Data collection and analysis is an ongoing process incorporating both formative and summative information. Accessibility samples of a percentage of pages across different parts of the institution's web site provide periodic snapshots of accessibility outcomes.

Institutional reports containing web accessibility data or summaries

As web accessibility is enacted across the institution, periodic reviews and accessibility audits are conducted to ensure that progress is continuing and that web pages, once made accessible, remain accessible despite changes made to them. These data are typically summarized in formal reports whether they are reports that have a sole focus on accessibility or not.

Reports from external evaluations of web accessibility outcomes

Periodic evaluation by an external reviewer provides fresh perspectives and an impartial assessment of an institution's progress and outcomes. This review can come from many sources including peer institutions, web accessibility groups, or standards specialists.

Correspondence describing outcomes

Correspondence between key personnel, regarding accessibility data and updates to administrators is used to provide a valuable window into the status of web accessibility outcomes at an institution.

Benchmark C: Assessment Results Are Used To Improve Institutional Accessibility

Data gathered from evaluations of both the process and the outcomes of web accessibility are of little value unless they are used to improve and inform what is to happen in the future. Ongoing oversight and review of data sources are used to make changes to procedures to ensure that the institution can create and maintain enterprise-wide web accessibility. Moreover, these same data can be used for future changes in institutional policy.

Evidence of this benchmark may include:

Reports that reflect recommendations for change

Recommendations for action can affect any aspect of institutional web accessibility including policy, staffing, budget, process, or plan. The recommendations can come from a variety of sources and can be recorded in a range of formats including reports, meeting minutes, or correspondence.

Documentation that describes how data sources inform institutional efforts

The ability to adapt once the need is shown is essential to facilitate enterprise-wide web accessibility. Sometimes documenting how data sources will inform efforts is all that can be demonstrated until cycles of monitoring begin.



Appendix 3

Context for Analyses Matrices

Context for Analysis

In order to investigate the research questions of this study, the data were analyzed along a number of dimensions. Each main research question was answered using specific survey questions as shown in the following matrix:

Evaluation Matrix

Research Question	Survey Questions Used
To what extent are the indicators <u>appropriate</u> for the purpose of providing a framework for web accessibility?	Indicators 1-4 How appropriate is this indicator as part of a framework for considering web accessibility at your institution? How appropriate is this indicator as part of a framework for considering web accessibility at another institution? <i>What would make this indicator more appropriate as part of a framework for web accessibility at your institution?</i>
To what extent are the indicators <u>understandable</u> for the different target groups?	Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution? Indicators 1-4 How understandable is this indicator? <i>What was easy to understand?</i> <i>What was difficult to understand?</i>
To what extent are the indicators <u>useful</u> for the different target groups?	Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution? Indicators 1-4 This indicator would be an effective measure as part of a tool used for self-study for an institution This indicator would be useful in planning for system-wide web accessibility This indicator would be useful to accomplish system-wide web accessibility I think this indicator is generally useful
What is the overall consumer <u>satisfaction</u> with the indicators for the different target groups?	Demographics What is your primary job role in postsecondary education? How long have you worked in this type of position? What Type of Institution? Indicators 1-4 What is your overall opinion of this indicator? Summary Are you satisfied with the Visual Presentation / Layout of the Indicator Document? Are you satisfied with the Structural Organization of the Indicators (e.g., three tiers or levels of information)? Are you satisfied with the Content of the Indicator Document? What is your overall satisfaction with the Indicator Document? Would you use these indicators? Would you recommend these indicators? How do these indicators compare to other sources of similar information?

<p>To what extent are the indicators comprehensive enough to allow for differences across the different target groups?</p>	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution?</p> <p>Chi Square and Kruskal-Wallis across each of the dimensions: Appropriateness Understandability Usefulness Satisfaction</p>
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Article Matrix

Article	Research Question/ Survey Section	Survey Questions Used
<p>Paper #1</p> <p>Online Journal of Distance Learning Administration (OJDLA)</p> <p><i>Article was targeted toward administrators and discussed the reasons for the development of the Institutional Indicators with the goal of encouraging them to become advocates at their institution</i></p>	<p>To what extent are the indicators appropriate for the purpose of providing a framework for web accessibility?</p>	<p>Indicators 1-4</p> <p>How appropriate is this indicator as part of a framework for considering web accessibility at your institution?</p> <p>How appropriate is this indicator as part of a framework for considering web accessibility at another institution?</p> <p><i>What would make this indicator more appropriate as part of a framework for web accessibility at your institution?</i></p>
	<p>Respondents' experience with standards and self-study</p> <p><i>*not a research question but using information from survey</i></p>	<p>Demographic Information</p> <p>What type of Institution?</p> <p>Have you ever been involved in a web planning or web standards work group?</p> <p>Did the group address web accessibility for individuals with disabilities (i.e., students, faculty, staff)?</p> <p>Have you ever been involved in an institutional self-study for accreditation or other purposes?</p> <p>Did the self-study include a component that addressed web accessibility for individuals with disabilities (i.e., students, faculty, staff)?</p>

Article	Research Question/ Survey Section	Survey Questions Used
<p>Paper #2</p> <p>Journal of Special Education Technology (JSET)</p> <p><i>Article focused on the testing of the Indicators. It described the methodology of the study and discussed the findings based on the statistical analyses performed on the data.</i></p>	To what extent are the indicators appropriate for the purpose of providing a framework for web accessibility?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution?</p> <p>Indicators 1-4 How appropriate is this indicator as part of a framework for considering web accessibility at your institution? How appropriate is this indicator as part of a framework for considering web accessibility at another institution? <i>What would make this indicator more appropriate as part of a framework for web accessibility at your institution?</i></p>
	To what extent are the indicators understandable for the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution?</p> <p>Indicators 1-4 How understandable is this indicator? <i>What was easy to understand?</i> <i>What was difficult to understand?</i></p>
	To what extent are the indicators useful for the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution?</p> <p>Indicators 1-4 This indicator would be an effective measure as part of a tool used for self-study for an institution This indicator would be useful in planning for system-wide web accessibility This indicator would be useful to accomplish system-wide web accessibility I think this indicator is generally useful</p>
	What is the overall consumer satisfaction with the indicators for the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution?</p> <p>Indicators 1-4 What is your overall opinion of this indicator?</p> <p>Summary Are you satisfied with the Visual Presentation / Layout of the Indicator Document? Are you satisfied with the Structural Organization of the Indicators (e.g., three tiers or levels of information)? Are you satisfied with the Content of the Indicator Document? What is your overall satisfaction with the Indicator Document? Would you use these indicators? Would you recommend these indicators? How do these indicators compare to other sources of similar information?</p>
	To what extent are the indicators comprehensive enough to allow for differences across the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution?</p> <p>Chi Square and Kruskal-Wallis across each of the dimensions: Appropriateness Understandability Usefulness Satisfaction</p>

Article	Research Question/ Survey Section	Survey Questions Used
<p>Paper #3</p> <p>Educause Quarterly (EQ)</p> <p><i>The article discussed the differences found between the groups targeted by the study. It looked at the participant's experiences, understanding and attitudes regarding web accessibility and how this may influence their opinion of web accessibility and the Indicators.</i></p>	To what extent are the indicators understandable for the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution? Indicators 1-4 How understandable is this indicator? <i>What was easy to understand?</i> <i>What was difficult to understand?</i></p>
	To what extent are the indicators useful for the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution? Indicators 1-4 This indicator would be an effective measure as part of a tool used for self-study for an institution This indicator would be useful in planning for system-wide web accessibility This indicator would be useful to accomplish system-wide web accessibility I think this indicator is generally useful</p>
	What is the overall consumer satisfaction with the indicators for the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution? Indicators 1-4 What is your overall opinion of this indicator? Summary Are you satisfied with the Visual Presentation / Layout of the Indicator Document? Are you satisfied with the Structural Organization of the Indicators (e.g., three tiers or levels of information)? Are you satisfied with the Content of the Indicator Document? What is your overall satisfaction with the Indicator Document? Would you use these indicators? Would you recommend these indicators? How do these indicators compare to other sources of similar information?</p>
	To what extent are the indicators comprehensive enough to allow for differences across the different target groups?	<p>Demographics What is your primary assignment in postsecondary education? How long have you worked in this type of position? What Type of Institution? Chi Square and Kruskal-Wallis across each of the dimensions: Appropriateness Understandability Usefulness Satisfaction</p>
	<p>Attitudes and Understanding of Web Accessibility</p> <p><i>*not a research question but using information from survey</i></p>	<p>Have you ever been involved in a web planning or web standards work group? Did the group address web accessibility for individuals with disabilities (i.e., students, faculty, staff)? Have you ever been involved in an institutional self-study for accreditation or other purposes? Did the self-study include a component that addressed web accessibility for individuals with disabilities (i.e., students, faculty, staff)? Rate the importance of web accessibility to your institution Rate the importance of web accessibility to you <i>What factors do you believe influence your institution's attitudes regarding web accessibility?</i> <i>What factors influence your attitude regarding web accessibility?</i></p>

Appendix 4
Sample Recruitment Letter

We Need Your Expertise!



The Internet has become an integral part of higher education today. From choosing a school through graduation and beyond, the Web is used by students and faculty alike for everything from online learning to critical administrative functions. Most traditional courses now have online components and online engagement in higher education is growing at an exponential rate. However, for the 8.5% of the population that has at least one disability that impacts computer and Internet use, inaccessible websites can inhibit or severely restrict their participation in post-secondary education.

Most Americans will experience some type of disability in their lifetime. This disability could be temporary, such as a broken leg or much longer term. The U.S Census Bureau estimates that 54.4 million people in the US (or 19%) have some level of disability. For those with disabilities, computers and the Internet can be a boon. With the use of assistive technology, persons with disabilities have access to a great deal of information that was previously unavailable to them. For example, students with visual impairments once had to rely on assistance to register for classes. Now, online registration systems can allow students to enroll and make changes to their schedule while retaining their privacy and independence. However, inaccessible designed or formatted websites can make the process difficult if not impossible for those same students.

While most institutions acknowledge that web accessibility is an issue, many grapple with how to achieve and maintain an accessible web presence. As the complexity and sophistication of the Web has increased over the years, the accessibility of postsecondary websites over the past decade have shown little improvement. Recent research suggests that accessibility issues can still be found on over 97% of webpages one click from the homepage of randomly sampled university websites.

Project GOALS (Gaining Online Accessible Learning through Self-Study) along with SREB (The Southern Regional Education Board) and other partners, is developing a set of materials useful for postsecondary entities who wish to engage in self-study on the accessibility of their institution's web content. The cornerstone of these materials is a set of Institutional Indicators that provide a framework for strategic planning and continuous improvement for enterprise-wide web accessibility across an institution.

In order to ensure that they are useful and appropriate for their purpose, Project GOALS is conducting a study to help evaluate and improve the Institutional Indicators. It is essential that they are understandable, useful and appropriate to their purpose. A secondary purpose of this study is to try to gauge the attitudes and understanding of postsecondary institutions regarding web accessibility.

As a member of the education community, your insights and opinions regarding the indicators and web accessibility in general are invaluable. We are looking for volunteers to participate in an evaluation of the Indicator documents. Participants will be contacted via email and asked to review the materials and complete a web-based survey regarding the appropriateness, understandability and usefulness of the document. Participation should take approximately one to one and a half hours. If you would be willing to participate in this study, please contact _____ at _____.

Thank you in advance for your assistance in this study.

Visit Our Website: ncdae.org/goals/

Appendix 5

IRB Letter of Information

Utah State
UNIVERSITY
Center for Persons with Disabilities
6818 Old Main Hill
Logan UT 84322-6818
Telephone: (435) 797-3656

LETTER OF INFORMATION

A Study to Explore the Social Validity of Institutional Indicators to Promote System-wide Web Accessibility in Postsecondary Institutions

Introduction

Most Americans will experience a disability in their lifetime. This disability could be temporary, such as a broken leg or much longer term. The U.S Census Bureau estimates that 51.2 million people in the US (or 18%) have some level of disability. For those with disabilities, computers and the Internet can be a boon. With the use of assistive technology, persons with disabilities have access to a great deal of information that was previously unavailable to them. Students with visual impairments once had to rely on assistance to enroll and register for classes. Now, online registration systems such as that at Utah State University allow students to retain their privacy and independence. However, assistive technology alone cannot overcome many of the access problems created by improperly designed or formatted websites.

Project GOALS (Gaining Online Accessible Learning through Self-Study) is working to develop a set of materials useful for education entities who wish to engage in self-study on the accessibility of their institution's web content. The cornerstone of these materials is a set of Institutional Indicators which provide a framework for assessing and planning for system-wide web accessibility across an institution.

Professor Cyndi Rowland and Heather Mariger, Project Coordinator of Project GOALS at the Center for Persons with Disabilities at Utah State University, is conducting a research study to help improve the Institutional Indicators. You have specifically chosen to assist us in evaluating these indicators as your experience and opinions can provide valuable insight on how to improve and market these materials.

Purpose

This study has been designed to help us evaluate and improve the Institutional Indicators developed as part of the self-study materials. The indicators are the cornerstone of these materials as they will provide the foundation for the development of all future materials. Therefore, it is essential that they are understandable, useful and appropriate to their purpose. A secondary purpose of this study is to try to gauge the attitudes and understanding of postsecondary institutions regarding web accessibility. As a member of the education community, your insights and opinions regarding the indicators and web

accessibility in general are invaluable.

This research is being conducted as part of a doctoral thesis by Heather Mariger and is being supported by the Project GOALS staff.

Procedures

If you agree to be in this research study, this is what you can expect will happen:

You will be directed to a webpage with instructions and links to two items:

1. An Adobe PDF file of the indicator document
2. A 64 question Survey (the majority of questions require only a single click)

You will be asked to review the pdf version of the Indicator document (item 1). Once you have reviewed the document, you will be asked to fill out the anonymous online questionnaire regarding your opinions and suggestions regarding the indicator document (item 2). At the end of the questions regarding each indicator, we have also included the ability to rate and comment on the benchmarks and evidence associated with that indicator. ***Use of this feature is purely voluntary*** and you may use it to comment on as many or as few sections as you please. We welcome any thoughts or suggestions that you have.

Risks

The risks to you in this study are very small. But every study has something that unknowingly might add risks or discomforts for you including the inclusion of some question that may be sensitive or offensive to you. Please know that there may be unforeseen risks, but in our experience in conducting similar studies the risk is small. We understand and appreciate that completing the questionnaire and reading the study materials provided in the study package took you away from other tasks in your busy schedule. We thank you for your help.

Benefits

There will be no direct benefit to you from working with us in this study right now. However, for your participation, you and your institution will be offered a finalized copy of the indicators which you have helped to improve. An additional potential benefit may be that you gain additional insight into system-wide accessibility. Also, you help researchers improve the Internet for others in the future.

Explanation & offer to answer questions

If you have any comments, concerns, or would like to discuss this study, you are free to contact Dr. Rowland or Heather Mariger at any time: 797-3656 (*local*), 1-866-284-2821 (*Toll free—ask for Heather Mariger*) or email: heatherm@cpd2.usu.edu.

If you have questions about your rights as a participant in this research or if there is something that you do not feel you can discuss with Heather Mariger, please contact the Institutional Review Board of Utah State University at 797-1821 (*in Logan Utah*) or 1-866-284-2821 (*Toll free*) and ask to be transferred to True Fox in the IRB office.

Extra Cost(s)

There will be no costs involved in your participation other than the costs associated with using your computer and the Internet (e.g., electricity and bandwidth use).

Voluntary nature of participation and right to withdraw without consequence

Participation in research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence or loss of benefits.

Confidentiality

Research records will be kept confidential, consistent with federal and state regulations. Only the investigators and the server administrator will have access to the data which will be kept on a password protected computer in a locked room. Records will be kept with those from the study which this one precipitates and destroyed with them. If the project survey is conducted, that data will be kept beyond the period of federal funding. I would expect these records to be destroyed within 7 years.

IRB Approval Statement

The Institutional Review Board (IRB) for the protection of human participants at USU has approved this research study. If you have any pertinent questions or concerns about your rights or a research-related injury, you may contact the IRB Administrator at (435) 797-0567 or email irb@usu.edu. If you have a concern or complaint about the research and you would like to contact someone other than the research team, you may contact the IRB Administrator to obtain information or to offer input.

Cyndi Rowland
Principal Investigator
797-3381

Heather Mariger
Co-PI
797-3656
1-866-284-2821

I certify that by clicking on the link to continue, I am consenting to my participation in this anonymous study to evaluate the Institutional Indicators developed by Project GOALS

Appendix 6

Results of Analysis Matrices

Results of Analysis

Descriptive analyses were run on the data to find the overall mean scores for each question and the means for each of the target groups, institution types, and the length of time in position. In addition the data were analyzed using the research dimensions (appropriateness, understandability, usefulness, and satisfaction) as dependent variables and demographic information (job role, years in position, institution type, participation in groups, familiarity with web accessibility, and importance of web accessibility to participant and institution) as independent variables.

While Spearman's Rho was run for all demographic questions against the participants' ratings, no notable correlations were found. Analyses were also run to find any associations between the importance of web accessibility (both to the participant and their institution) and the participants' familiarity with web accessibility. A moderate association ($r = .417$) was shown between the importance of web accessibility to the participant and the importance of web accessibility to their institution ($p = .000$).

Additional variables including document format preference, comparison to other documents, predicted use and recommendation of the indicators, problems and whether they would add or remove any information were also analyzed using the demographic information. The following pages contain a set of matrices which record any significant results by each research dimension. Each significant result is entered in the appropriate box within the matrix and the specific indicators and dimension (when appropriate) are noted along with the final p value in parentheses. Those evaluations with no significant results are indicated by "No Sig."

Matrix Indicating Differences Between Demographic Information and Rating Means for the Appropriateness of Indicators for Providing a Framework for Web Accessibility

	Appropriateness to Your Institution		Appropriateness to other Institutions		Overall Appropriateness
	<i>Individually</i>	<i>Across Indicators</i>	<i>Individually</i>	<i>Across Indicators</i>	
Primary Job Role <i>*Admin Rated Lowest</i>	I1 (.032),	No Sig	No Sig	No Sig	No Sig
Years in Position	No Sig	No Sig	No Sig	No Sig	No Sig
Type of Institution <i>*2-year rated higher</i>	I1 (.004), I2 (.009)	.019	I1 (.034), I2 (.021)	No Sig	I1 (.014), I2 (.013)
Web Planning Group	No Sig	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig	I2 (.041)	No Sig	No Sig
Self-study Involvement	I2 (.028)	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig	No Sig	No Sig	No Sig
Familiarity with WA	No Sig	No Sig	No Sig	No Sig	No Sig
Importance of WA to you	No Sig	No Sig	No Sig	No Sig	No Sig
Importance of WA to Inst	No Sig	No Sig	No Sig	No Sig	No Sig

Statistical Significance—The number in parentheses is the p value

Legend:

I1—Indicator 1

I2—Indicator 2

I3—Indicator 3

I4—Indicator 4

Matrix Indicating Differences Between Demographic Information and Rating Means for the Understandability of Indicators

	Understandability	
	<i>Individually</i>	<i>Across Indicators</i>
Primary Job Role <i>*Admin Rated Lowest</i>	I3 (.023)	No Sig
Years in Position	I2 (.008) I3 (.036)	(.045)
Type of Institution <i>*2-year rated higher</i>	I1 (.003), I3 (.004), I4 (.009)	(.012)
Web Planning Group	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig
Self-study Involvement	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig
Familiarity with WA	No Sig	No Sig
Importance of WA to you	No Sig	No Sig
Importance of WA to Inst	No Sig	No Sig

Statistical Significance—The number in parentheses is the p value

Legend:

I1—Indicator 1
I2—Indicator 2
I3—Indicator 3
I4—Indicator 4

Matrix Indicating Differences Between Demographic Information and Rating Means for the Usefulness of the Indicators

Usefulness				
	<i>Individually</i>	<i>Across single Indicator</i>	<i>Across Indicators by usefulness type</i>	<i>Overall</i>
Primary Job Role <i>*Admin Rated Lowest</i>	I1ss (.021) I3ss (.006), I3p (.040),	I3 (.043)	SS (.050)	No Sig
Years in Position	I1ss (.035), I2ss (.032), I2p (.014), I3ss (.002), I3p (.02), I3a (.025), I3g (.017), I4ss (.028), I4p (.028), I4a (.028), I4g (.032)	I2 (.026), I3 (.003), I4 (.038)	SS (.009), P (.016), O (.008)	(.009)
Type of Institution <i>*2-year rated higher</i>	I2ss (.015), I2p (.019), I3p (.024), I4ss (.047), I4p (.034)	No Sig	SS (.011), P (.012)	No Sig
Web Planning Group	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig	No Sig	No Sig
Self-study Involvement	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig	No Sig	No Sig
Familiarity with WA	No Sig	No Sig	No Sig	No Sig
Importance of WA to you	No Sig	No Sig	No Sig	No sig
Importance of WA to Inst	No Sig	No Sig	No Sig	No Sig

Statistical Significance—The number in parentheses is the p value

Legend:

I1—Indicator 1
I2—Indicator 2
I3—Indicator 3
I4—Indicator 4

SS—Useful for Self-Study
P—Useful for Planning
A—Useful for Accomplishing
O—Overall Usefulness

Matrix Indicating Differences Between Demographic Information and Rating Means for the Satisfaction with the Indicators

	Satisfaction with Indicators		Overall Satisfaction	
	<i>Individually</i>	<i>Across Indicators</i>	<i>Individual Aspects</i>	<i>Across Summary</i>
Primary Job Role <i>*Admin Rated Lowest</i>	No Sig	No Sig	No Sig	No Sig
Years in Position	I2 (.013)	No Sig	No Sig	No Sig
Type of Institution <i>*2-year rated higher</i>	I1 (.021), I2 (.017), I4 (.001)	(.037)	No Sig	No Sig
Web Planning Group	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig	No Sig	No Sig
Self-study Involvement	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig	No Sig	No Sig
Familiarity with WA	No Sig	No Sig	No Sig	No Sig
Importance of WA to you	No Sig	No Sig	No Sig	No Sig
Importance of WA to Inst	No Sig	No Sig	No Sig	No Sig

Statistical Significance—The number in parentheses is the p value

Legend:

I1—Indicator 1

I2—Indicator 2

I3—Indicator 3

I4—Indicator 4

V—Visual Presentation

S—Structure

C—Content

O—Overall Satisfaction

Matrix Indicating Differences Between Demographic Information and Rating Means for the Participants' Satisfaction with Aspects of the Indicator Document

	Format Preference	Comparison to Other Products	Would You Use the Indicators	Would You Recommend the Indicators	Did You Have Any Problems?	Would You Add/Remove Anything?
Primary Job Role	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig
Years in Position	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig
Type of Institution	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig
Web Planning Group	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	(.036) * Preferred Print	No Sig	No Sig	No Sig	No Sig	No Sig
Self-study Involvement	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig
<i>With Accessibility</i>	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig
Familiarity with WA	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig
Importance of WA to you	No Sig	No Sig	No Sig	No sig	No Sig	No Sig
Importance of WA to Inst	No Sig	No Sig	No Sig	No Sig	No Sig	No Sig

Statistical Significance—The number in parentheses is the p value

VITA

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EDUCATION

2011: Ph.D. Instructional Technology—Utah State University
 Dissertation Topic: Social Validation of Institutional Indicators for System-Wide Web Accessibility

1998; M.S. Institutional Management—Kansas State University
1987; B.A. Hotel/Restaurant Administration—University of Nevada, Las Vegas
1987; Summer Studies in Switzerland—L'ecole Hotelier de Lausanne, Switzerland
1985; A.A. Culinary Arts—Paul Smith College, New York

PROFESSIONAL EXPERIENCE

UTAH STATE UNIVERSITY—LOGAN, UTAH— 3/99—Present

Project Coordinator—Project GOALS —10/08—Present

Currently serving as the Project Coordinator for Project GOALS (Gaining Online Accessible Learning through Self-Study). Responsibilities include organization and development of all aspects of the project including creation of educational materials, research, project promotion and dissemination and evaluation of project deliverables.

CPD Administrative Staff—5/07—10/08

Assisted with a number of CPD Related activities including Marketing, Promotion and Center Press. Served as publisher of the online CPD NewsFlash and developer and co-editor of the CPD CenterPoint News. Developed historical materials and impact stories and assisted in the planning and execution of the Center's 35th Anniversary Celebrations.

Graduate Research Assistant- NCDAE—6/04—10/08

Provided ongoing work for the National Center on Disability and Access to Education (NCDAE). Developed marketing material (e.g., NCDAE logo, brochures, information

packets), coordinated National Meetings, created Posters and Presentation Materials, Researched and Maintained RSS Feeds, and Performed General Research for NCDAE Staff.

Graduate Research Assistant—SPIES—3/99—5/04

Served as the Webmaster and Technology Specialist for Project SPIES (Strategies for Preschool Intervention in Everyday Settings.) Worked with SPIES Staff to adapt curriculum for Parents to be accessed over the Internet. Responsible for Website Development, Data Entry, Analysis, and Maintenance of Participant Tracking System, and Conducting Evaluation and Usability Testing on Websites.

Presentation Materials and Evaluation Consultant—8/97—Present

Develop, Design, and Enhance Posters and PowerPoint™ Presentations for Faculty and Staff at Utah State University and Kansas State University and Affiliates including USU Extension and Nutrition and Food Sciences. Developed evaluation materials for assorted products and websites.

Web Course Development—3/99—8/99

Developed and administrated the Web-based course “**Introduction to Hospitality**” for the Culinary Arts/Food Service Management program in the Department of Nutrition and Food Sciences.

KANSAS STATE UNIVERSITY—MANHATTAN, KANSAS—08/97—02/99

Graduate Research/Teaching Assistant

Assisted in the coordination and development of Distance Education courses for the Department of Hotel, Restaurant, Institute Management and Dietetics (HRIMD). Worked as part of the Aircraft Carrier Engineering Study (ACES) Task Force to inspect and survey the foodservice systems on-board the US Aircraft Carrier CVN-75 in order to make suggestions and recommendations regarding kitchen design and service improvements. Completed a grant from the Kansas Department of Aging (KDOA) to do an analysis of all Congregate Meal Sites in the state of Kansas.

UTAH STATE UNIVERSITY CATERING—LOGAN, UTAH—03/93—05/97

Catering Coordinator/Associate Catering Manager

In charge of all Catering activities and staff. Responsible for all aspects of an award winning university catering operation. Responsible for staffing, scheduling, sales, and coordination of front and back of the house activities before and during catering functions. Served as Troubleshooter for Front Office Operations and aided in the hiring, training, and transition of Front Office Personnel.

AMERICAN CONSULATE—ST. PETERSBURG, RUSSIA- 05/92—12/92

Executive Chef

Duties included planning, coordinating, purchasing, ordering and preparation of foods to be served at all representational events hosted by the Consulate General.

MARYLAND/VIRGINIA/WASHINGTON, D.C.—08/90—04/92

Special Events Consultant

Self Employed. Responsible for the Planning, Set-up, and Catering of various events including Weddings, Showers, and Private Parties. Also assisted with the running of a meetings series on “Clean Air and Water.” Involved in the ongoing development of a cookbook for Alzheimer care givers in association with the Alzheimer’s Association and Cooperative Extension.

THE HIGHLAND HOTEL—WASHINGTON, DC—11/89—07/90

Director of Food and Beverage

Responsible for all areas pertaining to Food and Beverage including Menu Planning, Purchasing, Banquet Catering and Sales, Inventory, Staffing, Public Relations, and In-House Promotion.

TAJ INTERNATIONAL—WASHINGTON, DC—10/87—10/89

Senior Management Trainee

Introduced to all aspects of the Hospitality Industry including Sales and Marketing, Accounting, Housekeeping, Front Office, Reservations, Maintenance, Food and Beverage (front and back of the house), General Administrative, and Troubleshooting.

CHIN’S RESTAURANT—LAS VEGAS, NEVADA—02/86—12/86

Hostess

Primary duties included greeting and seating guests, organizing waiter stations and coordinating waitstaff.

FRIENDLY’S RESTAURANT—COCKEYSVILLE, MARYLAND—06/85—08/86

Prep, Line, and Breakfast Cook

Hired upon demand for two summers due to competence, positive attitude and good basic skills. Served as Prep and Line cook, trained staff, assisted in food inventory, and maintained quality control.

HOTEL SARANAC—SARANAC, NEW YORK—09/84—03/85

Line Cook

Requested by hotel to assume employee duties during the school year, post successful internship at the hotel. Served in broiler, saute, fry, prep, garde manger, and saucier stations.

HOTEL SARANAC—SARANAC, NEW YORK—05/84—07/84

Intern

Capably performed kitchen and restaurant duties as Kitchen Steward, Buffet Manager, prep and line cook, catering, bakery, purchasing, garde manger, hostess, and waitress.

PROFESSIONAL ORGANIZATIONS

Usability Professionals Association —2002—Present

Member

CHRIE—1998—2000

Member

Phi Kappa Phi—1998—Present

Member

Eta Sigma Delta—1997—2000

Member

American Institute Of Food And Wine—1994—1998

Member

NACUFS—Region VIII—1993—1997

Member

Attended 1993 Annual Regional Conference. Responsible for the planning and service of all on campus meals and breaks including an interactive workshop on “Food Display and Presentation Techniques.”

IFSEA—University Of Nevada, Las Vegas—1986—1987

Student Liaison

Functioned as effective student liaison between Junior and Senior chapter of IFSEA and managed campus office. Was instrumental in organizing and promoting the IFSEA “**CHOCOLATE FEST**” resulting in the most successful fundraiser to date. Was recognized for outstanding work and chosen to represent the Western Division of IFSEA at their annual conference in New Orleans.

IFSEA—Paul Smiths College, New York—1984—1985

Vice President—Student Chapter.

Served on Executive Planning Committee. Actively involved in student government and in promoting and planning all phases of campus activities and events.

STUDIES

Dissertation Study (2010). Designed and implemented a survey to assess the social validation of a set of Institutional Indicators designed to provide a framework for system-wide web accessibility in post-secondary institutions.

Meta-Analysis and Validation (2008). Worked with Steppingstones staff to review articles and studies in order to quantify recommendations and information on improving web accessibility for persons with cognitive disabilities then assisted in the validation of the data collected.

Focus Group (2005). Moderated focus group evaluating the survey instrument for the Agricultural Health and Safety Survey of Utah Agriculturists.

Product Evaluation (2005). Developed Evaluation Forms for teaching a new software program “*Menu Builder*” Created at Utah State University for Food Service Workers and Dieticians.

Usability Test (2004). Usability test to determine the usability and acceptability of two chapters being developed for an online food safety course for the department of Nutrition and Food Sciences.

Focus Group (2004). Moderated a focus group to review relevant issues and questions for the development of an instrument for research on Agricultural Health and Safety.

Usability Test (2003). CPD (Center for Persons with Disabilities) new website structure.

Usability Test (2003). SPIES (Strategies for Preschool Intervention in Everyday Settings) for Parents Website: Testing and Evaluation of instructional website.

Usability Test (2002). SPIES (Strategies for Preschool Intervention in Everyday Settings) for Parents Website: Preliminary Study and Report

Iterative Evaluation (2002). Evaluation of a Webcourse developed for USU Cooperative Extension and Shown at the Agricultural Specialists Conference in Las Vegas, Nevada.

Website Evaluation (2001-2002). SPIES (Strategies for Preschool Intervention in Everyday Settings) for Parents Website: Focus Groups and Online Evaluations.

Focus Groups (2001). Utah State Library Division: Served as member of Focus Group Moderation and Evaluation Team for study commissioned by the Utah State Library Division to evaluate Library Employees’ perception of the LSTA (Library Services and Technology Act) and Pioneer System.

KDOA Senior Center Study (1998). Congregate Nutrition Site Survey, Information and Training Package, Site Directory, Data Output, and Final Report.

CVN Food Services Systems Reports (1998). Kansas State ACES (Aircraft Carriers Engineering Study) Task Force recruited to analyze and summarize the status of US Navy Aircraft Carriers—Specifically the CVN 77.

PAPERS AND PUBLICATIONS

Refereed

Rowland, C., Mariger, H. Siegel, P. & Whiting, J. (2010). Universal design for the digital environment: Transforming the institution. *Educause Review*, 45(6), 14-29.

Mariger, H., Rowland, C., Whiting, J. & Christensen, W. (2009). Leading the charge: Ensuring your institution's web presence works for everyone. *Action Paper for Project GOALS*. Retrieved from <http://ncdae.org/goals/actionpaper.cfm>

Rowland, C., Mariger, H., Whiting, J. & Christensen, W. (2009). Best practice indicators for institutional web accessibility. *Indicator Document for Project GOALS*. Retrieved from <http://www.ncdae.org/goals/indicators.cfm>

Cook, R., Rule, S., & Mariger, H. (2003). Parent's evaluation of the usability of a web site on recommended practices. *Topics in Early Childhood Education*, 23(1), 19-27.

Albrechtsen, K., Mariger, H., & Parker, C. (2001). Distance education and the impact of technology in Europe and Japan. *Educational Technology Research and Development*, 49(3), 107-115.

Mariger, H. & Miller, J. (1999). Distance education evaluation—The next step. *Advances in Hospitality and Tourism Research Volume IV*, pp 428-437. Presented at the Fourth Annual Graduate Education and Graduate Students Research Conference in Hospitality and Tourism, January 4-6, 1999, Las Vegas, NV.

Non-Refereed

Rowland, C., Mariger, H., Whiting, J., Christensen, W. (2008). FY 07 Gaining online accessibility through selfstudy project annual report. Logan, Utah: Center for Persons with Disabilities.

- Rule, S., Blair, M., Mariger, H., Rowland, C., & Smith, J. (2007). Distance education for individuals with disabilities: National Center on Disability and Access to Education. Final Report on Congressional Award P116Z050043. US Department of Education, Office of Postsecondary Education.
- Rule, S., Blair, M., Rowland, C., Smith, J., & Mariger, H. (2007, May). The times they are a changin'. NCDAE Newsletter. Available online at ncdae.org/community/newsletter/may2007/. Logan, Utah: Center for Persons with Disabilities.
- Rowland C. & Mariger, H. (2007, March). Web accessibility system change: The myths, realities, and what we can learn from two large scale efforts. *NCDAE*. Retrieved August 21, 2008 from <http://ncdae.org/policy/systemchange.cfm>
- Mariger, H. (2006, June). National Center on Disability and Access to Education Newsletter. *Cognitive disabilities and the Web: Where accessibility and usability meet*. [Online] Available: <http://www.ncdae.org/community/newsletter/june2006/>
- Rule, S., Rowland, C., Smith, J., Blair, M., Mariger, H. & Salzberg, C. (2005, August). Electronically- Mediated Education: Challenges of Accessibility. *Proceedings of the International Special Education Conference (ISEC) Inclusion: Celebrating Diversity*. August 1-4 2005. University of Strathclyde, Glasgow.
- Rule, S., Mariger, H., Cook, R., & Seo, K. (2005). Evaluation of a web-based curriculum for families of Preschoolers with disabilities [Abstract]. *Proceedings of the 38th Annual Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities*. 35.
- Mariger, H., Rule, S., Benitz, C., Blair, M., Menlove, R., Rowland, C., Salzberg, C., & Smith, J. (2004). NCDAE: Accessibility in Higher Education and Practice. *Proceedings of the American Council on Rural Special Education (ACRES) 24th Annual Conference*, 186-194. Orlando, FL.
- Mariger, H. (2004). A look at learning in everyday settings. [Invited Article] *Utah State University/Center for Persons with Disability's Parent News*, 27(4), 1-4.
- Rule, S., Mariger, H., & Cook, R. (2003). *SPIES outreach: Curriculum and internet support for use of naturalistic intervention strategies with young children* (Final Report Project #H234R990009). Utah State University, Center for Persons with Disabilities: Logan, UT.

Mariger, H., Seo, K. & Rule, S. (2003). Usability analysis: How to involve consumers in website design. *Proceedings from the American Council on Rural Special Education (ACRES) 23rd National Conference: Rural Survival*. March 19-22, 2003. Salt Lake City, Utah.

Mariger, H., Cook, R., & Rule, S. (2002). The development and evaluation of a web-based preschool intervention curriculum. *Head Start's 6th National Research Conference Proceedings "The First Eight Years, Pathways to the Future"* 785-786.

PRESENTATIONS

Mariger, H. (2009, June). A perspective of institutional indicators designed to promote institutional web accessibility by targeted groups, *Sloan-C International Symposium on Emerging Technology Applications for Online Learning*, San Francisco, CA.

Rowland, C., & Mariger, H. (2008, November). Project GOALS: Gaining Online Accessible Learning through Self-Study, *Western Cooperative for Educational Technology & the Higher Learning Commission*, Phoenix, AZ.

Rowland, C., & Mariger, H. (2008, November). Policy versus practice: The state of web accessibility in the US colleges and universities and how to improve it, *Western Cooperative for Educational Technology & the Higher Learning Commission*, Phoenix, AZ.

Rowland, C., Mariger, H., Garn, M., & Shea, P. (2007, November). Next Generation Web Accessibility: Providing Solutions for System Change. *Presentation to the 19th annual conference of Western Cooperative of Educational Telecommunications (WCET)*: Atlanta, GA.

Rule, S., Rowland, C., Smith, J., Blair, M., Mariger, H. & Salzberg, C. (2005, August). Electronically- Mediated Education: Challenges of Accessibility. *Presented at the International Special Education Conference (ISEC) Inclusion: Celebrating Diversity*. August 1-4 2005. University of Strathclyde, Glasgow

Rule, S., Mariger, H., Cook, R., & Seo, K. (2005, February). Evaluation of a web-based curriculum for families of Preschoolers with disabilities. *Presented at the 38th Annual Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities*. Gatlinburg, TN.

- Mariger, H. & Rule, S. (2004, April). If your users can't find it, it isn't really there: A practical guide to website usability. *Invited Presentation at the Catch the Technology Wave: Education, Community Health, and Supports for Persons with Disabilities Conference*, Memphis, TN.
- Mariger, H., Seo, K., & Rule, S. (2003, August). Usability Testing: A Simple and Cost-Effective Technique for Creating a More User-Friendly Website! *Presented at the 15th Annual Instructional Technology Institute*. Utah State University, Logan, Utah.
- Mariger, H., Seo, K., & Rule, S. (2003, May) Principles of User Centered Design in Action: Usability Testing of the SPIES for Parents Website. *Presentation to the CPD Advisory Board. May 13, 2003*. Logan, Utah
- Mariger, H., Rule, S., & Seo, K. (2003, March). Usability analysis: How to involve consumers in website design. *Roundtable Discussion at the 23rd Annual American Council on Rural Special Education*. Salt Lake City, UT.
- Mariger, H., Seo, K., & Rule, S. (2003, March). Are your users learning or just lost? Building a model for usability testing web-based educational curricula. *Presented at the Sixth Annual Intermountain Paper and Poster Symposium*. Utah State University, Logan Utah.
- Seo, K. & Mariger, H. (2003, March). Assessing the instructional value of cooperative learning in teacher education: Perspectives of pre-service teachers. *Presented at the Sixth Annual Intermountain Paper and Poster Symposium*. Utah State University, Logan Utah.
- Mariger, H., Rule, S., & Cook, R. (2002, August). Potential users as partners in web development: The creation and evaluation of a web-based curriculum for parents of children with disabilities. *Presented at the 14th Annual Instructional Technology Institute*. Utah State University, Logan, Utah. Available: <http://it institute.usu.edu/archive.php>
- Rule, S., Cook, R. & Mariger, H. (2002, March). Families Tell Us If the Web Works: Disseminating the SPIES Curriculum. *Presentation to 18th Annual Pacific Rim Conference on Disabilities*. Honolulu, HI.
- Mariger, H., Cook, R., & Rule, S. (2002, March). Creating a web-based curriculum: The development and evolution of SPIES for Parents. *Presented at the Fifth Annual Intermountain Paper and Poster Symposium*. Utah State University, Logan Utah.

Rule, S., Cook, R. S., Mariger, M., & Lancelot, B. (2000). Intervention in natural settings: What do we do on Monday morning? *Presented at the annual convention of the Division for Early Childhood*, Albuquerque, NM.

Mariger, H. (1999). The history of cuisine. *Presentation for the Classified Employee Week Luncheon at Utah State University*, Logan, Utah

Mariger, H. & Miller, J. (1999, January). Distance education evaluation—The next Step. *Advances in Hospitality and Tourism Research Volume IV*, pp 428-437. Presented at the Fourth Annual Graduate Education and Graduate Students Research Conference in Hospitality and Tourism, Las Vegas, NV.

Mariger, H. (1997). Bartending basics. *Presentation and instructional Videotape for the CA/FSM Beverage Class at Utah State University*, Logan, UT.

POSTERS

Mariger, H., Rowland, C. & Whiting, J. (2010). Is your web presence accessible for everyone? The development and evaluation of a set of institutional indicators of institution-wide web accessibility. *Poster Presentation at the Graduate Research Symposium*, Logan Utah, March 31, 2010

Mariger, H. (2009, July). *The social validation of institutional indicators designed to promote institutional web accessibility*. Poster presentation to the AHEAD 2009 Global Access: Opening a World of Opportunity The 32nd Conference of the Association on Higher Education And Disability. The Galt House in Louisville, KY.

Roland, C. & Mariger, H. (2008, November). *Project GOALS: Gaining Online Accessible Learning Through Self-Study*. Poster presentation to the 20th annual conference of Western Cooperative of Educational Telecommunications (WCET): Phoenix, AZ.

Mariger, H. & Rule, S. (2004, April). Creating a useful web site by including families as participant-developers. *Presented at the Catch the Technology Wave: Education, Community Health, and Supports for Persons with Disabilities Conference*, Memphis, TN.

Mariger, H., Rule, S. & Cook, R. (2003, February). Creating family-friendly websites: a usability testing example. *Presented at the 19th Annual Pacific Rim Conference on Disabilities*, Honolulu, HI.

- Rule, S., Mariger, H., & Cook, R. (2002, December). Informing families about recommended practices: Lessons learned from the internet. *Presented at the 18th Annual Division for Early Childhood Conference*, San Diego, CA.
- Rule, S., Mariger, H. & Cook, R. (2002, November). SPIES and SPIES for Parents: Two websites. *Presented at the OSEP Early Childhood Conference*, Washington, D.C.
- Mariger, H., Cook, R., & Rule, S. (2002, June). The development and evaluation of a web-based preschool intervention curriculum. *Presented at Head Start's 6th National Research Conference: The First Eight Years, Pathways to the Future*. Washington, D.C.
- Mariger, H., Cook, R., & Rule, S. (2002, March). Evaluating a web-based curriculum: Development, evolution, and evaluation of SPIES for Parents. *Presented at the 9th Annual Early Intervention Research Institute Conference*. Utah State University, Logan, UT.
- Rule, S., Cook, R. S., Mariger, M., & Lancelot, B. (2000, November). Intervention in natural settings: What do we do on Monday morning? *Presented at the annual convention of the Division for Early Childhood*, Albuquerque, NM.
- Cook, R. S. & Mariger, H. (2000, September). Strategies for Preschool Intervention in Everyday Settings. *Presented at the Early Childhood Special Education Conference*, Provo, UT.
- Mariger, H., Cook, R. & Rule, S. (2000). Project SPIES: Strategies for Preschool Intervention in Everyday Settings. *Presented at the OSEP Annual Meeting*, Washington, D.C.

NEWSLETTERS

NCDAE Newsletter (2005—present). Ongoing service as editor and contributing author. Responsible for all recurring features, coordination publication, and soliciting content for feature articles.

CPD NewsFlash (2006-2007). Served as assistant editor, created and maintained online presence, collected and reported news and publicity on CPD from outside sources.

CPD CenterPoint News (2006-2007). Served as assistant editor, redesigned look and layout and prepared document for printers. Maintained database and coordinated with postal service for mailings and uploaded content to online format.

WEBSITES

Project SPIES for Parents (2001—2004). Support and Information website to assist parents and caregivers of children with disabilities: <http://www.spies.cpd.usu.edu/>

Project SPIES (1999—2004). Information and support site for SPIES (Strategies for Preschool Intervention in Everyday Settings) Outreach and Partner Facilities: <http://www.spiesforparents.cpd.usu.edu/>

Kid Talk (2003- 2004). In conjunction with SPIES for Parents, a guide to help parents learn how to combine communication and behavior strategies so their children can learn to communicate effectively and avoid acting out:
<http://www.spiesforparents.cpd.usu.edu/KidTalk/Welcome.htm>

Introduction to Hospitality (1999). Webcourse developed for the Department of Nutrition and Food Sciences at Utah State University.

OTHER MATERIALS AND ACTIVITIES

RSS Feeds: NCDAE RSS Feed (2004—present). *Maintain, find articles, and update daily the RSS (Really Simple Syndication) feed for the National Center on Disability and Access to Education (NCDAE) website.* Center for Persons with Disabilities, Logan, Utah
Conference Planning: NCDAE National Discussion on Accessible Distance Education and IT Follow-Up Conference (2006). *Assisted in the planning and coordination of the Summit Follow-Up Meeting at ATIA, Orlando, Florida*

Conference Planning: National Discussion on Accessible Distance Education and IT (2005). *Assisted in the planning and coordination of the National Discussion on Accessible Distance Education and IT at NCTI, Washington, D.C.*

Instructional Materials: Food Profile Cards and Template (1998—present). *Developed the layout and design of food profile cards used by the Nutrition and Food Sciences department and USU Extension in ongoing training workshops, Logan, Utah*

Resume: NCDAE Resume (2005). *Created, developed, maintained, and published activities resume for the NCDAE Project.* Logan, Utah

Promotional Presentation: Active Reentry Presentation (2005). *Created and developed a multimedia presentation for the Independent Living Center in Vernal, Utah for their Active Re-Entry program. The presentation is in use by multiple sites across Utah.*

Conference Planning: NCDAE Summit Follow-Up Conference (2005). *Assisted in the planning and coordination of the Summit Follow-Up Meeting at ATIA, Orlando, Florida*

Information Sheet: NCDAE Year 1 Accomplishments (2004). *Created, developed, and published informational brochure on NCDAE Project.* Logan, Utah

Conference Planning: NCDAE Summit on Disability and Access to Education (2004). *Assisted in the planning of a National Summit on Disability and Access to Education and coordinated all aspects of the conference setting, food service, and hospitality arrangements.* Washington, D.C.

Brochure: NCDAE—National Center on Disability and Access to Education (2004). *Created, developed, and published informational brochure on NCDAE Project.* Logan, Utah

Judge: Chocolate Fest (1999 & 2000). *Invited judge of annual charity event, the Logan Chocolate Fest.* Logan, Utah

Radio Interview: The History of Cuisine (1999). *Discussed culinary history on Utah State University Radio Station,* Logan, Utah

Guest Lectures: Introduction to Culinary Arts (1998-1999). *Invited lecturer for Culinary Basics and History of Cuisine for the Department of Nutrition and Food Sciences' Culinary Arts Program,* Utah State University, Logan, Utah

Newsletter: International Society of Travel and Tourism Educators (ISTTE), Volume 13—Four editions (1997). *Assistant Editor,* Kansas State University, Manhattan, Kansas

Workshop: Food Preparation and Presentation (1997). *Presented at Red Mesa Navajo Chapter Senior Center.* Montezuma Creek, Utah, Navajo Reservation

Instructional Videotape: Bartending Basics (1997). *Developed instructional Videotape for presentation in the CA/FSM Beverage Class at Utah State University,* Logan, Utah

Training Manual: USU. Catering Waitstaff Handbook (1995). *Creation and Development of training manual for USU Food Services,* Logan, Utah

Training Manual: USU. Skyroom Waitstaff Handbook (1995). *Creation and Development of training manual for USU Food Services,* Logan, Utah